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CONGENITAL DEFORMATION AND DEFUNCTIONALIZATION OF THE CAUDAD ILEUM AND COLON *

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The descending colon of the embryo, on account of the width of its mesentery, is at first freely movable and lies well over to the left side of the abdominal cavity. In consequence the left layer of its mesentery lies in contact with the parietal layer of the peritoneum. Subsequently fusion of these two peritoneal layers takes place. The fusion begins near the median line, that is, near the root of the mesentery, and extends outward. The fused layers eventually become converted into loose connective tissue. Thus, this portion of the colon loses its mesentery and becomes fixed to the abdominal wall.

This fusion extends usually in the caudad direction as far as the medial border of the left psoas muscle, and takes place to a variable extent in the iliac fossa. Owing to irregularities in the fusion of the mesocolon descendens to the mural peritoneum, transverse folds or septa are developed and small paracolonic fossae are formed. At the lowest level of normal fusion, that is, at the proximal or cephalad end of the sigmoid, a distinct band, marking the edge or lower border of the fusion, tethers the sigmoid to the abdominal wall. This bandlike margin is the linea terminalis, which stands out conspicuously when the sigmoid is drawn ventrally, giving added depth to the recessus intersigmoideus. As the sigmoid mesocolon does not as a rule fuse with the parietal peritoneum, but remains freely movable, it is readily seen that acute angulation may occur at this level as it does at other fixed points of flexure or angulation, as at the hepatic flexure or splenic angle. If normal embryologic fusion of the two peritoneal surfaces in this region is excessive, that is, if the fusion extends so far laterally as to obliterate the space between the mural peritoneum and the tunica serosa of the distal descending colon and proximal sigmoid, fixing the intestine itself to the abdominal wall, such excessive fusion is to be looked on as a predisposing factor in stagnation in this segment.

Fig. 1.—Diagram showing cross-section of colon of embryo: above, with long mesentery before fusion; middle, normal fusion of mesentery of colon to parietal peritoneum; below, excessive fusion extending over ventral surface of colon.

A similar fusion of the outer lamina of what is at first a free and loose mesentery of the ascending colon with the contiguous mural peritoneum also takes place on the right side. Excess of this fusion gives rise to the condition noted but not explained by Byron Robinson and observed with great frequency since, the condition in which a longitudinal plica of peritoneum seems to have been pulled up from the bottom of the paracolonic trough and fused like a patch on the lateral surface of the colon sometimes as high as the tenia libera or median longitudinal band. Inequalities of normal fusion on the right side give rise to transverse bands or folds dividing the paracolonic space into fossae as on the left side. Such transverse folds are so constant as to be considered anatomic. The peritoneum of the abnormal or excessive fusion folds is usually whitish, and being supported by loose connective tissue, it is usually rather firm in texture. These structures bear very little resemblance to the hyperemic or vascular diaphanous membrane described by Jackson. Such extensive fusion not rarely fetters or angulates the lower extremity of the descending colon and the proximal end of the sigmoid. If during abdominal operations one has in mind the normal embryologic fusion here mentioned, it will not be difficult to understand the frequent presence of adhesion bands fixing the sigmoid to the parietal serosa in such an excessive degree as to embarrass its function.

It should be noted that the sigmoid colon is still relatively long and freely movable at birth.

Frommer, Curschmann and Concetti recognize in the elongated, sagging, redundant sigmoid a persistence of the fetal and infantile condition in which the mesentery is broad and free and this portion of the large intestine relatively long. The letter M sigmoid often observed in the adult is a common finding in the fetus.

There is another important embryologic factor in the etiology of sigmoidal stagnation, this being the presence in the fetal and postnatal abdomen of a fold of peritoneum extending from the mesentery of the proximal sigmoid downward and outward in the direction of the internal abdominal ring. This persisting

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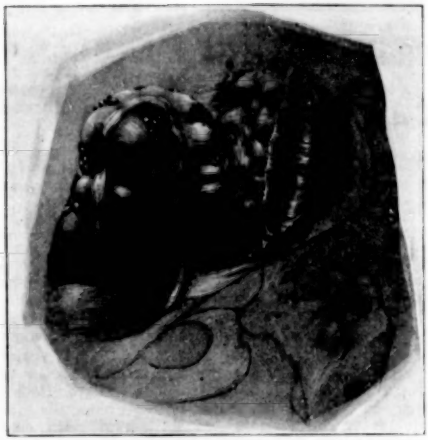

Fig. 2.—Postnatal condition probably the result of excessive fusion of colon mesentery to parietal peritoneum as shown in Figure 1.

fold takes the same course as the plica vascularis of the descending testis or ovary. There is perhaps sufficient reason to believe that the postnatal fold on the right side of the abdomen extending from the mesentery of the terminal ileum to the genital gland, which has been called the ileopelvic band by Lane and which in the female may by traction on the appendix be drawn up as the appendiculo-ovarian ligament, are but remnants of the very conspicuous fetal fold of peritoneum which is drawn out by traction of the inguinal ligament on the descending genital gland, the inguinal ligament becoming in the male the gubernaculum testis and in the female the round ligament.

Fig. 3.—Erratic fusion membranes in layer arrangement binding proximal sigmoid.

Douglas Reid described a fold which in the fetus takes the same general course. He called it the genitomesenteric fold. Thus, it will be seen that on the right side a distinct tendency for the development of folds extending from the ileocecal region down to the genital gland has been rather clearly shown. Excessive fusion in embryo of the mesenteries of the ileum and cecum with the folds just mentioned, and downward traction of the descending genital gland, may be suspected fairly of producing displacements and deformities of the terminal ileum and cecum. On the left side of the abdomen as well, the descent of the testis and ovary draws out a very distant fold, the course and attachments of which are similar to those of the fold on the right side, except that on the left it is the mesentery of the sigmoid which is concerned instead of the mesentery of the terminal ileum and cecum. Conditions with respect to this fold do not vary greatly in the two sexes. The inguinal ligament in the female extends from the primitive position of the ovaries in the lumbar region of the abdominal cavity to the groin, where it passes through the abdominal wall, traversing the inguinal canal to terminate in the labium majus. It should be recalled that as the ovary and testicle, developing in their primitive position behind the peritoneum, increase in size, they project toward the peritoneal cavity. The peritoneum covering them forms a mesentery which anchors them to the posterior wall of the abdomen. By the time the genital glands reach the pelvis of the embryo, the mesorchium or mesovarium continues downward to the internal abdominal ring as the inguinal ligament. The peritoneal fold thus developed may by very slight traction on the ovary or testis be exhibited in embryo as a ridge as high as 6 cm. or more. In operation for inguinal hernia in the male adult, downward traction on the neck of the peritoneal sac often brings into prominence the remnant of this fetal fold, traversing from the inguinal canal to the mesentery of the cecum on the right and from the internal abdominal ring to the mesentery of the proximal sigmoid on the left. The presence of this fold may help to explain the frequency with which the cecum and sigmoid descend into the sacs of inguinal hernia.

As fusions of mesenteries to the fold of the descending gland produce deformities in the ileocecal region on the right, so similar fusions and contractures may fix or angulate the proximal sigmoid on the left. Many clinicians have noted the tendency of deforming bands and folds to dispose themselves between the proximal sigmoid and the left internal abdominal ring.

No doubt the principal factor in the arrest of intestinal contents in the sigmoid is an anatomic one. In many individuals, particularly in the new-born, the sigmoid begins with a sharp turn upward or obliquely to the right and upward from the linea terminalis. Frequently there are other sharp angulations, as in the letter M sigmoid, rather common in the fetus and adult. Occasionally a sharp curve is seen at the third sacral vertebra where the sigmoid goes over into the rectum.

It has been known for many years that the feces remain normally and physiologically in the sigmoid and

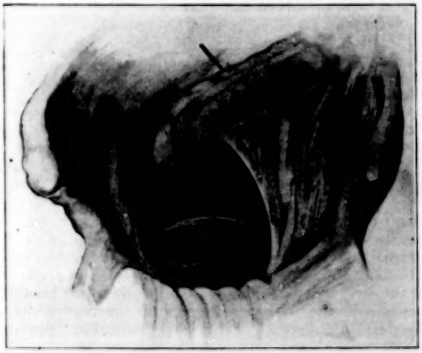

Fig. 4.—Linea terminalis or lower border of normal fusion between descending colon and abdominal wall (after Sobotta and McMurrich).

Fig. 5.—Linea terminalis (or lower border of fusion on left side) fixing proximal sigmoid (after Piersol).

do not descend into the rectum between one defecation and the next. Stasis of excrement in the sigmoid beyond physiologic limits leads to colitis in this part of the large intestine, as elsewhere. Ulceration may appear as the result of long retention of colon contents. Inflammation of the mucous membrane is a natural result of stagnation of bowel contents. The serosa reacts to the irritation of high-grade localized distention, a condition which may be called colitis infiltrativa chronica is established, and fixation adhesions of the peritoneum of the sigmoid are of almost constant consequence. Thus, embryologic, anatomic, physiologic and pathologic factors which are inherent in the sigmoid itself lead to sigmoidal constipation. Deforming adhesions due to a pathologic condition extrinsic to the bowel, as of uterine adnexa, may also of course defunctionalize the sigmoid.

Fig. 6.—Traction of fold or adhesion of sigmoid at *B*, causing sharp angulation at *A*.

Those abnormal attachments of the sigmoid which are due to excesses or irregularities of embryologic fusion are usually not so firm but that they can be broken up by gauze dissection, by wiping, so to speak, with gauze the sigmoid away from the parietal peritoneum. Fortunately, the almost complete absence of blood vessels in the fusion membranes makes sharp division of these structures simple and safe; thus, the linea terminalis may be put on the stretch and divided upward with scissors or knife without bleeding. Not infrequently such irregularities of fusion take the form of manifold layerlike adhesions in the neighborhood of the linea terminalis, and often one layer or septum of adhesions after another can be wiped away. However, the firmer bands which follow the course of the fetal fold developed by the descent of the genital gland usually require the knife or scissors-spreading dissection for their division. On liberation of the sigmoid from the restraint of such excesses or irregularities of fetal fusion, the return of more nearly normal function is evidenced frequently by the passing of flatus, and if the deformities of the sigmoid thus induced are not associated with deforming and obstructing intestinal lesions elsewhere, the prospect of relief of stasis with its consequent ills may become good as the result of a very simple measure.

As is well known, another common site of deforming defunctionalizing adhesions is about the cecum and terminal ileum. Up to the fourth month of embryonic life, this, like other parts of the large intestine, hangs by an ample mesocolon. Subsequently, however, this mobility becomes lost, owing to the fusion between the outer lamina of the mesocolon and the neighboring mural peritoneum. It should be noted that this fusion takes place in varying degree, and thus we can account for many irregularities in the attachments of the cecum and ascending colon. After normal fusion, the mural serosa becomes continuous with the tunica serosa of the ascending colon. The fused layers behind the colon disappear as such, and the posterior wall of the latter no longer has a peritoneal covering.

Instances of retrocecal and retroperitoneal appendix may be explained rationally by assuming that before fusion occurs the appendix becomes caught between the coalescing peritoneal surfaces of the cecal mesentery and the abdominal wall. In cecal descent and torsion the appendix might readily be arrested at an abnormally high position and between the serous surfaces mentioned. Thus a true retroperitoneal position of the appendix could be established. This truly retroperitoneal position of the appendix is obviously different from that condition in which, after fusion has occurred, the appendix is buried under a membrane developed by adhesions of small folds about the ileocecal region to the mural serosa, which adhesions are drawn out as membranes over the caput coli and appendix during normal cecal torsion.

Fig. 7.—Fusion of terminal ileum and peritoneal fold of descending testis resulting in postnatal angulation of terminal ileum.

The normal fusion of mesentery to mural serosa as a rule does not extend down to include the cecum, but it may do so. At the lower termination of the fusion there is a sharp border of foldlike margin called the plica caecalis or subcecal fold, to the medial side of which under the free unattached caput coli and lower cecum is the fossa cecalis. Excesses and abnormalities of this process of peritoneal fusion may, it is clear, lead to deformation of the cecum and ascending colon. I have noted in an adult an instance in which excessive fusion had occurred between the mural peritoneum and the tunica serosa of the ascending colon continuing mediad in places as far as the tenia libera or longitudinal muscle band. Not rarely the fusion extends so far downward that the plica caecalis or lower margin of the fusion is firmly attached to the caput coli, interfering with its movements and functions.

On the right side we must add to the abnormalities mentioned those folds and membranes which are developed by adhesions between the terminal ileum or cecum and the parietal peritoneum before normal cecal torsion has taken place. Thus, the plica ileocaecalis, a fold of varying size, extending under normal conditions from the mesenteriolum of the vermiform process to a line on the terminal ileum opposite its mesentery, may become adherent to the mural serosa before cecal torsion takes place, and later, as the terminal ileum rolls mediad, be drawn out into a membrane covering the caput coli and appendix. In a similar manner sheets of peritoneum may be drawn over the cecum and ascending colon as a result of adhesion between the two contiguous peritoneal surfaces before cecal torsion occurs. Such anomalous peritoneums persisting from fetal life often interfere with the drainage of the cecum, the terminal ileum and the vermiform appendix. It is usually not a difficult matter in the adult to divide such fusion adhesions or separate them by gauze or scissors-spreading dissection.

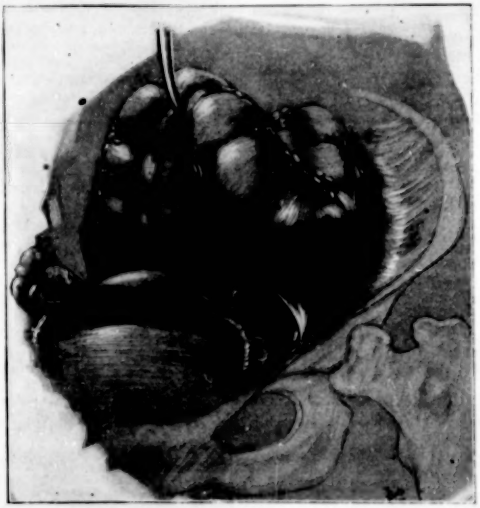

Fig. 8.—Fusion of mesentery of proximal sigmoid and plica vascularis or fold of descending genital gland resulting in postnatal band tethering sigmoid to internal abdominal ring.

At this point it is desirable to call attention to the difference in origin, in histologic construction and clinical effects between these abnormalities, the result of irregularities or accidents of fetal fusion, and the vascular loosely attached weblike, diaphanous membrane which covers the cecum in the condition of membranous pericolitis. Fetal fusion bands and membranes show as a rule no signs of inflammation, are apparently almost bloodless, and have the appearance of thin connective tissue. The diaphanous membrane of pericolitis or perityphlitis is characterized by abundant, somewhat parallel coursing vessels which, it should be noted, correspond in their course, division and distribution with the branches of the ileocolic artery. This vascular veil of apparently detached peritoneum cannot often, if ever, be completely removed without leaving a raw bleeding surface. This is obviously an affair of prenatal or postnatal hyperemia, congestion and inflammation, a reaction of the peritoneum to irritation often beginning in an inflamed mucous membrane of the appendix or cecum.

Summers observed such a condition following trauma to the abdomen. It is rare that a chronic appendicitis is not associated with this pericolitis membranosa vasculosa. The vascular web of membranous pericolitis may hamper peristalsis and occasionally may deform or dislocate the appendix vermiformis and interfere with its drainage; but by virtue of its loose disposition over the peritoneal surfaces, it being the hyperemic tunica serosa itself, it is not so often found as a deforming factor as is the fold or band resulting from accidents of fetal peritoneal fusion. It is worth nothing that whereas the vascular coat of membranous pericolitis cannot be removed, the excesses of fusion can be broken down by gauze and scissors-spreading dissection, and, being almost avascular, they do not readily reform. To attempt to strip off the vascular membrane of membranous pericolitis results in new adhesion formation, whereas the division of the white fusion bands is often to excellent purpose in releasing the tethered segment of intestine, and does not leave behind bleeding surfaces to unite in fresh adhesions.

In a general way the transverse mesocolon fuses with the parietal peritoneum about the beginning of the fifth month of the embryo, as does the mesocolon of the ascending and descending portions. That is, the posterior layer of the transverse mesocolon fuses with the parietal peritoneum. On the left the transverse mesocolon fuses on both its upper and lower surfaces with the peritoneal covering of the great omentum. This fusion of the transverse mesocolon with the peritoneum of the great omentum is subject to marked variations.

I have observed in the adult two instances in which the fusion of the mesentery of the transverse colon to the peritoneum of the great omentum continued downward on the right as far as the cecum, and on the left as far as the sigmoid. In another instance, the tunica serosa of the ascending colon was covered with a double layer of extra peritoneum made by fusion of

the anterior and posterior lamina of the great omentum, the double layer being in turn fused with the serosa of the ascending colon. In these instances, the tethering of the ascending colon to the transverse colon through the medium of this abnormal fusion was apparently responsible for a double-barrel relationship

Fig. 9.—Appendix bound to angulated ileum by abnormal ileocecal fold.

of the upper ascending colon to the right colon transversum. On the left side I have seen a somewhat similar double-barrel relationship secured by an exaggerated ligament of Toldt, that is, an excessive fusion of the great omentum with the proximal end of the descending colon.

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ABSTRACT OF DISCUSSION

DR. A. GOLDSPOHN, Chicago: Dr. Eastman mentioned the extraperitoneal appendix. Of course, we know of such a thing occurring back of the cecum in the ordinary location of the latter; but eighteen days ago I operated on a vigorous young man who had an extraperitoneal appendix lying wholly within the small pelvis beyond the cecum. Externally he had a painful indurated mass, about 2 by 6 cm. in size, that could be felt distinctly about 3 cm. inward from the right iliac crest parallel with it and extending down to near the outer end of Poupart's ligament. There were no signs of any intraperitoneal aggregation or inflammatory swelling beneath it, as from a circumscribed appendicitis. The diagnosis was very much confused by the fact that six days previously he had been injured by the end of a wagon pole that struck him above the symphysis pubis a little to the right, about the location of the external abdominal ring. This did not disable him from continuing with his work. About four days after this injury, however, he called a doctor because he had fever and nausea and pain in the region of the present swelling in the abdominal wall. The doctor naturally associated the sickness with the trauma which, however, probably had nothing to do with it. At my first examination it looked very much as if an internal and incomplete inguinal hernia were present, with strangulation of omental contents. Cutting down into this mass about 3 cm. from the border of the crest of the ilium, I found several pus foci in its deeper strata, while making my way by blunt dissection extraperitoneally into the small pelvis, along the track of a violent infection, down to the spermatic cord, in which I traced the vas deferens to the vicinity of the bladder. The peritoneum was elevated intact throughout and was mostly discolored dark bluish from contact with the infected area. After getting to the bottom of this I discovered, tied off and removed a mass that looked like gangrenous fatty tissue as large as my thumb, about 3 inches long, that could be gathered up and traced to a pedicle running upward. I did not at that moment recognize it positively as the appendix, because I did not expect to find such a thing there; but by postoperative dissection it was found to be the appendix. Desiring to inspect things within the peritoneal cavity, I cautiously did so through a small temporary incision in the parietal peritoneum. There was some accumulation of clear fluid in it but no redness of serous surfaces. Having opened up all the infected connected tissue areas in the pelvis and upward in the loin toward the right kidney, all extraperitoneally, the expanded cavities were thoroughly packed with gauze to drain out a generous incision left mostly open. The man continued to have some temperature for several days but afterward convalescence was normal and his recovery is assured, with a secondary closure of the wound to prevent a hernia.

DR. F. GREGORY CONNELL, Oshkosh, Wis.: The causes of the conditions described by Dr. Eastman have heretofore been classified as (1) inflammatory, and (2) congenital. After this I believe we may consider only the congenital. In corroboration of Dr. Eastman's point relative to the ileopelvic ligament of Lane and a similar ligament on the left side I should like to mention an instance in which I found no evidence of previous inflammation within the abdomen, but an extreme ptosis and redundant sigmoid with an adhesion, a fusion of the free omentum to the round ligament on the left side. The distinction which Dr. Eastman makes between this excessive fusion which may be demonstrated by the

Fig. 10.—Abnormal fold of Treves angulating cecum.

"white line" that Summers has emphasized, and these vascular affairs is very important, and should be kept in mind; by so doing, further discussion of the subject will be greatly simplified. The pericecal and the pericolic membrane must likewise be differentiated in a consideration of this subject. The picture thrown on the screen by Dr. Eastman, as typical of Jackson's membrane, is a pericecal membrane and not the pericolic membrane as described by Dr. Jackson.

Dr. Jerome Morley Lynch, New York: Of special interest is the statement that we may have in these congenital deformities no such thing as perfect fusion, that any two layers of the peritoneum may become separated and delaminated and cause deformity. I do not believe, however, that raw, healthy peritoneum ever is harmful. It is the subsequent inflammation that destroys the endothelium and leaves

Fig. 11.—Difference in appearance between Jackson's pericolitis membranosa vasculosa (covering cecum) and a fetal fusion patchlike membrane lateral to ascending colon. In the vascular pericolitis or perityphlitis there is hyperemia of the branches of the arteria ileocolica.

fibrous connective tissue. Unless this change has taken place dissection is unnecessary.

Dr. J. N. Jackson, Kansas City, Mo.: This is a subject which has interested me considerably in the few years since I first described what has since been termed "Jackson's membrane." It is something I have not said much about in the last few years, because so much that I have said has been misinterpreted. Many of these abnormalities exist because of fusion, transpositions, etc. I am of the opinion that we have two distinct types of conditions clinically. Undoubtedly there are a great many of these in which the clinical symptoms depend on the congenital malformation alone. Contractions and angularities produce symptoms which disappear when the conditions are corrected mechanically. Many of these cases have been relieved by division of the adventitious bands. On the other hand, after considerable experience, I am inclined to believe with Dr. Lynch that in a greater percentage there must be added infection. If these patients must be treated surgically, they must be treated subsequently by attention to the colon. I am coming to believe that in these advanced cases of membranous pericolitis the membrane never comes in contact with the cecum. There are few adhesions and probably no absorption from the ascending colon. I believe that most of these cases give rise to the old chronic symptoms due to chronic infection. In some cases resection of the entire ascending colon is indicated.

Dr. Joseph Rilus Eastman, Indianapolis: With the utmost respect for what Dr. Jackson has just said, I should like to say that not once, but a hundred times I have seen over the cecum and caput coli that thin veil, and I believe most of the gentlemen here interested in these anomalous membranes about the cecum and ascending colon will say that he has seen precisely what Dr. Jackson describes as membranous pericolitis on the cecum and caput coli many times. I did not undertake to say that these irregularities in fusion occur in every case, nor frequently, but that occasionally we find irregularities of this normal fetal fusion between the outer lamina of the peritoneum, mesentery and abdominal serosa in definite association with an arrest of the action of intestinal contents in that section, in association with stasis in that zone. It has not rarely been observed that the separation of this excessive fusion will permit the passage of extravasated abdominal contents, giving relief to the stasis. I do not say that it happens often; it certainly does occasionally. It oftentimes comes to pass that by the wiping away of these adhesions we can restore the function of the descending colon. I did not go into the relation of these anomalies to the various syndromes mentioned in the paper, because there was not sufficient time. I did try to emphasize that there is such a thing as decided excessive fusion between the mesenteries of the large intestine and the abdominal peritoneum, and that such excessive fetal fusion may extend around to the front to the longitudinal mural band and even across it in a medial direction, and that such fusions will interfere with the function of the large intestine. It is well to remember the possibility of the appendix becoming arrested between the outer lamina of the mesentery of the large intestine and the abdominal wall so that when the layers are obliterated the appendix can again occupy the retroperitoneal position. Then, too, it is worth while to recall that the postnatal inflammatory adhesions of the great omentum to the large intestine may represent a relationship of excessive fusion to the great omentum at the hepatic flexure and splenic flexure and may not represent adult pathology at all. We are greatly indebted to Dr. Jackson for what he has told us. I doubt whether any of us ever understood what he meant by the membranous pericolitis which he described. I can think of no reason why an inflammatory process evidenced by the dilation of the capillaries and in other ways

Fig. 12.—Erratic fusion of contiguous fetal peritoneal surfaces.

suggestive of inflammation should be limited to the ascending colon. I can understand how with the descent of the cecum the peritoneum might be pulled over the descending or ascending colon from the mural serosa, but this membrane pulled over would not have the appearance described by Dr. Jackson, that of the parallel crossing vessels. In the condition which Dr. Jackson describes as having partially separable membrane, it is like shaving smoke and when the

membranes are removed the condition is favorable to the formation of new adhesions. I think that we do find these two distinct types about the cecum and ascending colon. One is represented by the persistence of the excessive fusion between the large intestine, the mural bands and serosa of the fetal period; the other by the inflammatory condition of the ileocolic artery.

INDICATIONS FOR CHOLECYSTECTOMY *

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SAYRE, PA.

The operation of cholecystectomy has been accepted by experienced surgeons as the one of choice for most cases of gallbladder disease that in former years were simply drained. The literature of late has been filled with articles by many surgeons, the enthusiastic advocating cholecystectomy for all cases, the conservative decrying its general adoption.

Believing it would be of interest and profit to find out the profession's attitude in regard to the indications for cholecystectomy, I have reviewed the literature extensively and have been in correspondence with forty-five experienced abdominal surgeons. In the letters sent out the following information was asked:

1. What percentage of cases of cholecystostomy have had a recurrence of trouble following operation?
2. Are you performing cholecystectomy more frequently than in the past?
3. Have the results been better than when simple drainage was used?
4. In what cases do you consider cholecystectomy the operation of choice?
5. What are the contraindications for its employment?
6. As a rule, how do you treat empyema of the gallbladder?
7. How does the mortality of cholecystectomy compare with cholecystostomy in your work?

Fig. 1.—The liver and gallbladder are drawn out into wound; the infundibulum of the gallbladder is seen lying over the cystic duct and artery.

Question 1: What percentage of cases of cholecystostomy have had a recurrence of trouble following operation? This question has been a difficult one to answer accurately. It was not answered by five men; the remaining forty reported as follows:

Very few recurrences	5
Few recurrences	3
Small percentage of recurrences	5
	13

Other replies were: Many, exact number unknown; an uncomfortable percentage; many bitter disappointments.

The numerical percentage given by twenty-nine men varied from 1 to 33⅓ per cent. of failures. The average was 9.5 per cent.

Coffey reports infrequent recurrences. LaPlace gives 33⅓ per cent. Judd writes, "impossible to state, but we have had a large number of recurrences." Stanton, who has carefully investigated Ochsner's cases and his own, reports recurrences of trouble in 14.5 per cent. of cases. Kehr estimates there have been 15 per cent. of failures in his work.

Question 2: Are you performing the operation of cholecystectomy more frequently than in the past? There were forty-five answers: thirty-six answered in the affirmative, nine in the negative. Among the thirty-six affirmative answers some of the replies are of interest. Bevan and Frazier perform cholecystectomy in from 80 to 90 per cent. of their cases. Elting in 60 per cent., Gibbon in 50 per cent., and Clark in 33⅓ per cent. Martin employs cholecystectomy more frequently, but considers it a more dangerous operation; Deaver, more frequently than formerly, but not so often as many surgeons; Crile not much more often. In 1907, the Mayos performed 100 cholecystectomies, and 261 cholecystostomies; in 1915, 915 cholecystectomies, and but sixty cholecystostomies.

There were nine negative replies to the question. Bloodgood, Kelly, Cullen and Grant are not performing the operation so frequently as formerly.

Question 3: Have the results been better than when simple drainage was used? Thirty-six men answered yes; seven answered no; two failed to answer.

Question 4: In what cases do you consider cholecystectomy the operation of choice? The chief indications for removal of the gallbladder recommended by the majority are any disease of the gallbladder wall itself and damage to the cystic duct.

Three surgeons prefer cholecystectomy in every case; two, in all cases except those complicated by pancreatic disease; 80 per cent. advise removal when any disease of the gallbladder wall with or without stone is found, mentioning as indications thick-walled, enlarged gallbladders; thick-walled, contracted gallbladders; adherent gallbladders; adhesions to the pylorus (Lund); gangrenous gallbladders; in early malignancy confined to the gallbladder itself. Kehr urges cholecystectomy as a prophylaxis in cases of chronic cholecystitis which prove rebellious to medical treatment. Several (Mayo, Judd, Lathrop, Gibbon and others) call attention to the possibility of systemic joint infection secondary to disease in the wall of the gallbladder, as pointed out by Rosenow, and advise cholecystectomy as a prevention.

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

Obstruction or obliteration of the cystic duct, either by stone or stricture, is the next indication advised by the majority. A few call attention to the liability of stricture of the duct following the removal of an impacted stone. Some of the conservative men think cholecystectomy only indicated in the presence of gangrene and suspected malignancy of the gallbladder itself. Kelly employs cholecystectomy only in thick, contracted gallbladders and malignancy.

Mayo Robson mentions (1) phlegmonous cholecystitis, (2) gangrene of the gallbladder, (3) chronic cholecystitis, (4) in mucous fistula or hydrops due to stricture of the cystic duct, (5) in empyema, (6) in cancer.

Deaver advises the operation of cholecystectomy for (1) hydrops from obliteration of the cystic duct, (2) calcareous degeneration, (3) the cholesterin gallbladder of Moynihan, (4) chronic empyema, (5) gangrene, (6) carcinoma limited to the gallbladder itself, (7) extensive laceration or perforation of the gallbladder.

Crile advises cholecystectomy (1) if the cystic duct is occluded, (2) if the cystic duct has a decubitus, (3) if the gallbladder wall is injured by disease.

Elting advises the operation in old chronically thickened and adherent gallbladders and in certain acute diseases of the gallbladder in which there is no evidence of serious disturbance of the liver or the ducts.

Lilienthal gives all indications cited above and concludes that it is his belief that any gallbladder that is worth operating on may with advantage be removed.

Erdman says cholecystectomy limits morbidity and increases efficiency. As a result he is performing cholecystectomy in almost every case although there are some cases in which cholecystostomy must be performed.

Lane urges cholecystectomy because it removes the natural habitat of gallstones in the body and lessens the chance of recurrence. Cholecystectomy also gives an immediate and more comfortable convalescence. He quotes Finney as saying that more secondary operations are performed after cholecystostomy than after cholecystectomy. Crile believes that the clinical results of cholecystectomy are better than those of cholecystostomy, just as nephrectomy for a pus kidney is better than nephrotomy. He has never seen any adverse clinical results following excision of the gallbladder.

Babcock recommends cholecystectomy in the first stages of cholecystitis, but emphasizes many of the technical dangers. Cholecystostomy ought to be largely restricted to the third stage of cholecystitis, for cases of empyema, perforation, gangrene, and pancreatitis with duct involvement. He thinks in the hands of the average surgeon the mortality of cholecystectomy in the first stages of cholecystitis is less than for cholecystostomy in the last stages of the disease.

C. H. Mayo says cholecystostomy and the removal of stones will cure symptoms of mechanical obstruction, but does not cure chronic cholecystitis and cannot restore the destroyed walls of the gallbladder or free it from adhesions. He advises cholecystectomy for these and for all cases in which infection is the major feature, with or without stones. Chronic pancreatitis with gastric symptoms cannot be cured by cholecystectomy, but requires prolonged drainage.

Question 5: What are the contraindications for cholecystectomy? The chief ones may be said to be the following: Inexperience of the operator. Inexperience of the anesthetist; one who may not appreciate the fact that manipulations about the liver ducts may cause the patient to strain or cough, although fully anesthetized. Desperate condition of the patient, which will not permit any prolonged operation or any additional trauma. In the very obese, in whom good exposure cannot be obtained, or in the presence of perihepatic adhesions which make it impossible to draw the liver well down and rotate it outward through the wound. Edema of the gastrohepatic omentum and swelling of the ducts making it almost impossible to recognize them, is mentioned by some. Ochsner does not think it wise to operate on any case in the very acute stage. Mayo Robson does not believe in removing the gallbladder if there is no patency of the common duct. Deaver advises passing a probe through the cystic duct, the common duct, into the duodenum in all cholecystectomies to make sure the common duct is patent. Porter advises against removing the gallbladder if there is the slightest chance that it may have to be used for future drainage. Frazier, Deaver, Mayo, and Crile advise against cholecystectomy in pancreatic disease and in acute empyema. Cholecystectomy is contraindicated in patients who have already had one major operation performed, as a hysterectomy or umbilical hernia repaired.

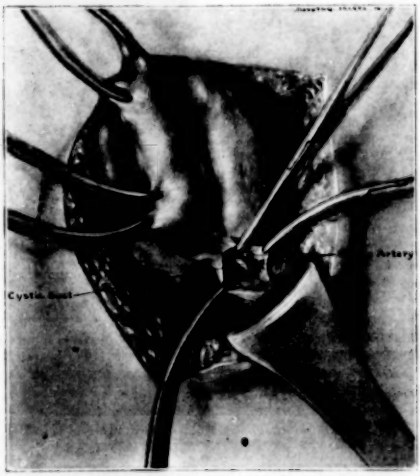

Fig. 2.—Infundibulum of the gallbladder lifted up away from the gastrohepatic omentum, exposing cystic duct and artery.

Clark was one of the first to advise exploring the gallbladder by touch through a midline incision during the course of other operations, believing that the gallbladder was the cause of a lot of the supposed gynecologic dyspepsia. In a recent paper he urges that the best judgment be used by the operator in deciding whether it is safe to attack the gallbladder at the time or to wait and have the patient submit to another operation.

Swope advises against removal when adhesions are so extensive that removal would be attended with marked traumatism and leave large areas of raw surfaces. He believes that a diseased gallbladder, like a diseased appendix, should be removed when the operation is safe; still, there are exceptions. He advocates cholecystectomy for hydrops and chronic empyema in the quiescent stage, when the infection has ceased to be active.

Question 6: As a rule do you treat acute empyema of the gallbladder with cholecystectomy or drainage? Forty-four men replied to this question. Thirty-three favored cholecystostomy, among whom were Crile, Deaver, Vander Veer, Estes, Cullen, Tinker, Gaub, Finney, Mulligan, Lower, McMullen, Clinton, Lathrop, Porter, McLean, Van Meter, Grant, Kelly, Gibbon, Loop, McGuire, and others.

Ochsner advises primary drainage and excision later, as do Werder, Stanton, Clark, and others. Elting feels that the gallbladder is only a part of a general infection and that drainage is needed. Bevan drains if the patient is very sick, but removes the gallbladder if the patient's condition is good or if the gallbladder is gangrenous.

Coffey does cholecystectomy in more than one half his cases. He believes the ones he drains should have the gallbladder removed later. Martin, Frazier, Haggard, LaPlace, Andrews and Beckman favor cholecystectomy.

Judd writes: "No definite statement can be made as to the best procedure in acute empyema. This is a matter that must be left to the surgeon's judgment in the individual case. If we can do a cholecystectomy as safely, we prefer to do it, though many times we believe that a cholecystostomy should be followed later by a cholecystectomy." Deaver has the same advice to give and says the question often makes Hamlets of us all.

Question 7: How does the mortality of cholecystectomy compare with cholecystostomy in your work? Among the forty-five answers to this question, two stated the difference in mortality was not known; four men's work showed a lower mortality for cholecystectomy than for cholecystostomy; eighteen reported the mortality the same for each operation; twenty-one had a higher mortality for cholecystectomy than for cholecystostomy (ranging from 0.5 to 3 per cent.).

The mortality for either operation was estimated by many men to be below 2 per cent.

Cholecystectomy is an operation, attended, I believe, with many more technical difficulties and dangers than simple drainage, and I regard it as a much more formidable one. Even in spite of good anesthesia, good assistance, the Bevan incision, good exposure cannot always be had and the operation cannot be as safe as drainage, if there is poor exposure. The operative dangers, aside from shock, are hemorrhage from the cystic artery, hemorrhage from the cut liver surface, requiring packs, and injury to the common or hepatic ducts.

Hemorrhage from the cystic artery may occur at the time of operation or later, from slipping of a ligature. Injury to the duct may be caused by clamping off the duct too close to the common duct, or by not appreciating the fact that the cystic duct oftentimes lies well up underneath the infundibulum or pelvis of the gallbladder, and that the common duct may lie directly beneath the pelvis.

As emphasized by Mayo and Judd, the folds of the gastrohepatic omentum should be split, the infundibulum of the gallbladder should be lifted up and separated from it by a dry gauze dissector, as advised by Mayo, or clamped by forceps, as advised by Deaver, to expose the cystic duct. It should be freed completely before it is clamped and cut. Before tying it off a probe is passed into the duodenum to make sure the common duct is patent. The artery is found, as a rule, to the inner side of the duct and above it. It is tied separately. The dissection is carried from below upward, because the circulation is controlled from the start and better exposure can be had by using the fundus of the gallbladder to hold the liver out of the wound.

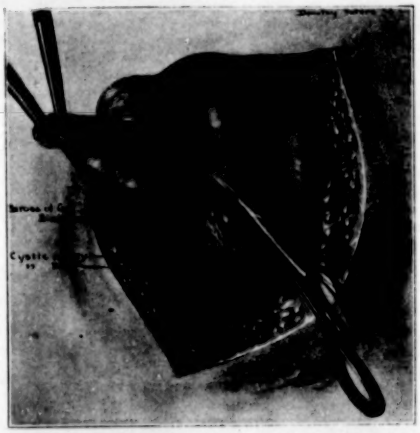

Fig. 3.—Cystic duct and artery ligated separately, gallbladder being dissected free from its bed, leaving a narrow strip of serosa.

Hemorrhage from the liver surface of the gallbladder bed can be prevented if the serosa is split in the long axis, dissecting the gallbladder out of its fibrous coat so as not to trespass on the liver. If there is much infiltration of the walls of the gallbladder it had better be removed in its entirety.

SUMMARY AND CONCLUSIONS

Reports show that recurrences happen in 9.5 per cent. of cases that have had cholecystostomies performed. The recurrence of trouble following cholecystectomy is certainly small; the exact percentage is not known.

Cholecystectomy is employed much more frequently than in the past and is a better operation, but it is attended with many more operative difficulties and dangers than simple drainage. The gallbladder should be removed when its wall is diseased or the patency of the cystic duct is in question, provided the patient's condition will permit it.

The contraindications for the operation are critical states of the patient, acute empyema, infection of the ducts and pancreatitis, where drainage is desired.

It is safer to treat acute empyema of the gallbladder with simple drainage and only right to explain to the patient that a second operation may be necessary.

Two safe operations are much better than one dangerous one, and in the case of doubt, simple drainage should be employed, especially by those inexperienced in gallbladder surgery.

ABSTRACT OF DISCUSSION

Dr. John B. Deaver, Philadelphia: I agree with Dr. Guthrie in toto. Much in this operation depends on the man behind the gun. Much harm has been done to the common and hepatic ducts by the removal of the gallbladder by men not fully equipped. I know of no more difficult operation, in certain cases, than cholecystectomy. In many instances the gallbladder has been taken out when it should have been left. A living patient with a gallbladder is better than a dead patient without a gallbladder. I have been interested in the subject of pancreatitis for a certain number of years, and with my assistant, Dr. Pfeiffer, made investigations of the influence of the secretions of the pancreas and lymphatics and find that these would be in favor of drainage against removal. Not only must the gallbladder be drained but the common duct. We must be able to read the signboards at the crossroads, to recognize the anatomic landmarks. If not we shall get into trouble in our surgery of the gallbladder and ducts. There is no subject that demands more greatly the master diagnostician or greater surgical skill.

Dr. Harry S. Noble, St. Mary's, Ohio: This question is most important. It is but a few years since the one operation on which all abdominal surgeons were agreed was the drainage of the gallbladder in the presence of infection. This was as axiomatic as the removal of the infected appendix, or the evacuation of pus under pressure. Suddenly this operation is called on to give reasons for its existence. It seems to me Dr. Deaver struck the nail squarely on the head when he said it depends on the man behind the gun, for it does depend on the mental attitude of the operator; his belief or disbelief as to the function of the gallbladder determines his treatment of the organ. The routine removal of the gallbladder is a slight justification of the young surgeon who cured club feet by means of an amputation. The gallbladder has a function, and this important organ should be conserved whenever possible. There is one fact observed by many surgeons in many lands, that should positively preclude the unnecessary removal of the gallbladder, and that is the process of dilatation which occurs in the common duct, and the attempt of nature to regenerate another gallbladder from the stump of the cystic duct. Flörcken reported a case of regeneration of the gallbladder with the formation of stones two and one-half years after removal of the gallbladder. I believe a similar case was reported through the columns of The Journal a few weeks ago. This process of dilatation in the duodenum is so well marked, that on one occasion it was mistaken for the duodenum. This fact alone proves that the gallbladder has a function and should positively preclude its removal. It has been shown by Halstead and Opie that pure bile injected into the pancreatic duct will cause a violent and dangerous pancreatitis; whereas bile, when mixed with mucus and so injected, will cause only a mild pancreatitis. The ampulla of Vater normally contains bile, pancreatic fluid, and mucus. Kemp of London in some of the earliest experiments on this subject showed that there was a difference in the alkalinity and chemical reaction of bile before and after passing the gallbladder. The gallbladder is one of the most constant organs in the abdomen of the vertebrate tribe—it is not in the least degenerative or vestigial in its actions. Why is it so constant in its occurrence, and why so uniform in size and appearance throughout the animal kingdom? Man was given a gallbladder before he was given a urinary bladder; and so far as I can learn the gallbladder is universally present in the carnivora. Remove it if you must, but accord it the same consideration you would an eye or a kidney, sacrifice it only when its potentiality for harm is greater than its possibility for good.

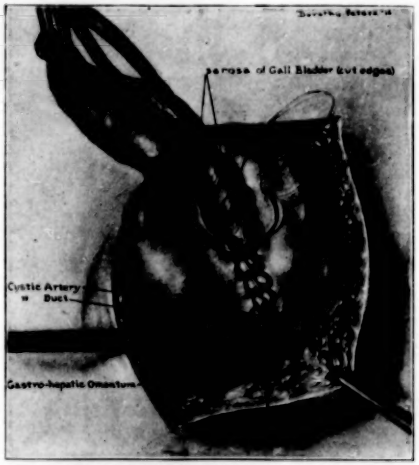

Fig. 4.—Split in gastrohepatic omentum being closed, covering cut ends of cystic artery and duct; suturing cut edges of serosa.

Dr. F. F. Lawrence, Columbus, Ohio: I want to call attention to the fact that, as a rule, the condition for which the gallbladder is operated on is not limited to the gallbladder, the common or the hepatic duct, but commonly involves a large part of the bile tract. The small hepatic ducts in the liver are also involved. It is not uncommon to find coming out of the drainage tube two, four or six weeks after a cholecystostomy, small stones which have come down from the small hepatic ducts, thus proving the involvement of the small ducts in the substance of the liver. The common duct is always partially or completely obstructed. In all the jaundice cases the common duct is obstructed. Drainage must be complete in order to have recovery. Suppose you remove the gallbladder and place gauze or tube drainage down in the common duct. You must wall off with gauze or other material to protect the general peritoneal cavity. Sooner or later you will have not only morbidity but mortality, because you have created a condition equal to or greater than that for which you operated, in the way of adhesions about the duodenum, hepatic flexure of the colon, the pylorus and other structures in the right upper quadrant. If the gallbladder were an organ like the appendix, there might be some excuse for its removal, but its removal should not receive the sanction of surgeons in general. In other words, cholecystectomy should be sanctioned only for malignancy, gangrene and acute perforation of the gallbladder, and I am not sure that it should be sanctioned for the last named.

Homemade Steriliser for Dairy Utensils.—A simple and efficient homemade steam sterilizer for dairy utensils, which can be very cheaply constructed, is described in Farmers' Bulletin No. 748 of the United States Department of Agriculture. The insufficiency of the most thorough ordinary cleanliness and the necessity for sterilization of all articles that come in contact with milk is becoming more and more impressed on dairy workers. The apparatus described is made out of an ordinary roasting pan, some galvanized sheet iron, sheet asbestos or paper packing and a small piece of steam pipe. It can be used on the kitchen stove or on any similar source of heat and will furnish steam at the outlet pipe at a temperature of 205 F. to 211 F., the lower temperature being the minimum to secure sterilization and subsequent drying of the apparatus.

FAT EMBOLISM IN BONE SURGERY

INCIDENCE AND PREVENTION *

EDWIN W. RYERSON, M.D.

CHICAGO

Fat embolism, as a clinical entity, received but little attention in this country until the excellent and scholarly paper of A. S. Warthin[1] appeared in 1913.

The clinical picture in fat embolism is fairly well marked. There is usually an incubation period of from twenty-four to thirty-six hours after the traumatism, whether surgical or accidental. In severe, crushing injuries this period may be reduced to three hours, as in the case reported by Beitzke.[2] Then ensues difficulty in respiration; not a true dyspnea, but rather an air hunger. This marks the entrance of the fat into the lungs from the right heart. Some patients may show no other symptoms and may make a speedy recovery. The temperature is not much elevated in this variety, but the pulse and respiration are rapid.

In severer cases the fat passes from the lungs to the left heart and into the general circulation. Entrance of the fat into the cerebral circulation causes nausea and vomiting, and the patient may become somnolent or comatose. The temperature is much elevated, and may reach 106 or 107 F. Fat appears in the urine and sometimes in the sputum. Petechiae may appear in the skin. It is hardly possible to estimate the mortality rate on account of the insufficiency of records.

The occurrence of several fatal cases in the writer's experience has led him to consider it a much more frequent and serious danger in bone and joint surgery than he had formerly supposed.

In 1905 a young woman was brought to the Chicago Policlinic Hospital with a Pott's fracture of the ankle, incurred a week previously, with marked deformity. She was given nitrous oxid gas, and the deformity was reduced without difficulty by the late Dr. A. B. Hosmer, assisted by the writer. In twenty-four hours there was marked difficulty in respiration, and the temperature rose to 102 degrees. No diagnosis was made beyond a probable ether pneumonia. She died in the course of the next twenty-four hours, and necropsy showed marked fatty embolism of the lungs. No examination of the brain was permitted. The urine was not examined for fat.

In 1914 a child was operated on by the writer for drop-foot due to infantile paralysis, at the Home for Destitute Crippled Children. A silk ligament suspension of the foot was done, small holes being drilled in the first and fifth metatarsal bones and in the tibia, through which the silk was passed. In about twenty-four hours the child, who had shown no shock and but little discomfort up to this time, began to vomit and to have difficult respiration. The temperature rose to 103. The urine contained no acetone and no albumin. Fat embolism was not suspected, and no necropsy was obtained.

In the same year a boy of 8 was operated on at the Children's Memorial Hospital for severe paralytic scoliosis. An Albee bone transplantation was made, a splint cut from the tibia by a motor saw being sewed into a cleft made by splitting the spinous processes of the lower dorsal and upper lumbar vertebrae. There was very little shock or postoperative discomfort, but in thirty hours a well-marked air hunger and rise of temperature supervened. The boy died a day or two later. Fat embolism was not suspected in this case, and no special examination was made with reference to it.

The occurrence of these two fatalities naturally caused a great deal of sorrow and anxiety to the writer. The operations had been performed under the same technic which had been used in a large number of other cases in which no such results had been noted. Dr. Ludwig Hektoen, professor of pathology in Rush Medical College, on hearing a more detailed description of the cases than has been given above, said at once that fat embolism seemed to him highly probable. A search of the literature made this probability seem even more certain and also revealed the fact that the large majority of the reported cases occurred after injuries or operations involving the lower extremity.

During the year 1915 another case of fat embolism occurred in the writer's service at the Children's Hospital, in which the diagnosis was made before death and confirmed by postmortem examination. This was an infant about 8 months of age, with congenital club feet. The feet were manipulated under ether anesthesia, and the plantar fascia and Achilles tendon were divided with a tenotome. The day after operation the child began to breathe with difficulty, the temperature rose high, and death ensued a day later. At necropsy the lungs were found to be the seat of marked fatty embolism. No examination of the head was permitted.

Several other cases have been recalled which were probably fat embolism, but which were not fatal, and in which no diagnosis was made at the time.

The treatment of fat embolism, as proposed in the literature, is apparently not on a well-defined basis. Only four specific procedures have received attention.

Czerny[3] advised the injection of 2 per cent. sodium carbonate, probably with the idea of forming a soluble soap. This method has received little support.

Schanz[4] gives a large quantity of normal saline infusion subcutaneously, and would inject it into a vein if the symptoms were very severe. This method does not seem rational to me.

Wilms[5] drained the thoracic duct for four days, with recovery of the patient. This procedure has been recommended by others, notably Tanton[6] in his comprehensive paper. It is based on the theory that the fat is carried principally by the lymphatic system rather than by the venous system, a theory which will find very few supporters.

Riener[7] advised the insertion of a cannula into the saphenous vein, and thence into the femoral vein, allowing the outflow of the venous blood with its admixture of fat. This treatment is based on the theory that the dosage of fat which causes the initial symptoms, sufficient for diagnosis, may not necessarily be fatal, and that the fatal dosage has not progressed as far upward as Poupart's ligament. It seems rational and valuable. Tanton[6] and others would open up the area of injury and remove the accumulated blood and fat, using drainage or tamponage. This also seems advisable. Venesection and lumbar puncture have been recommended.

None of the methods of treatment above mentioned, however, can be considered to have any distinct curative value in cases in which a large quantity of fat has been forced rapidly into the lungs. From a study of the reported cases it can fairly be assumed that the process is usually a very rapid one, and that by the

* Read before the Section on Orthopedic Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Warthin, A. S.: International Clinics, 1913, Series 23, Vol. 4.
2. Beitzke: Rev. méd. de la Suisse romande, 1912, xxxii, 501; abstr., THE JOURNAL A. M. A., Oct. 19, 1912, p. 1494.
3. Czerny: Quoted by Warthin, Footnote 1.
4. Schanz: Zentralbl. f. Chir., Jan. 1, 1910, abstr., THE JOURNAL A. M. A., Feb. 12, 1910, p. 576.
5. Wilms: Sem. méd., 1910, xxx.
6. Tanton: Jour. de chir., March, 1914, xii, No. 3; abstr., THE JOURNAL A. M. A., May 9, 1914, p. 1511.
7. Riener: Centralbl. f. Chir., 1907.

time a diagnosis is made any form of recorded treatment is likely to be of little value.

It becomes necessary, therefore, carefully to consider the methods of prophylaxis.

For many years I have seldom used the tourniquet in my operative work, for reasons which need not here be detailed. It is possible that this fact may explain the greater incidence of fat embolism in my clinics than in those of some other operators. No mention is made in the literature of the routine use of the tourniquet as a means of prophylaxis up to the year 1915.

It seems likely that a complete stasis of the circulation during and a short time after the operative procedures would probably prevent or at least reduce the transportation of the fat through the venous channels. Bürger believes that fat already disintegrated may become bound by coagulating blood.

The tourniquet can be left in place for as long as half an hour, and can then be gradually loosened. This idea was suggested in 1914 to Dr. H. Gideon Wells, director of the Sprague Memorial Institute, and a series of experiments was carried out under his direction at the University of Chicago in the spring and summer of 1915. A large number of dogs and rabbits were subjected to bone operations of various kinds. The writer had supposed that the removal of a bone splint from the tibia would be likely to cause severe fat embolism, since the medulla of the tibia is invaded and more or less injured by the saw blade. The experiments proved that this is not true, and that fractures and contusions of the bones cause much more embolism than does the performance of a typical Albee bone transplant to the spine. The use of the chisel and mallet is far more dangerous than the motor saw.

The experiments showed, also, that when a tourniquet was applied the fatty embolism from all kinds of traumatism to the bones was markedly decreased. This evidence convinced me that the tourniquet should be made a matter of routine in bone surgery.

When the laboratory work had been practically completed (a year after it had been suggested by me), an article was published by L. Bürger.[8] He states that the tourniquet should be applied to ward off fat embolism in all cases of fracture, and advises Momburg's constriction at the waist line in very severe cases, especially with crushing injuries of the pelvis. "Half an hour should be sufficient," he says. Another precaution is to avoid the transportation of patients with such injuries; "any attempt to move them to a distance is liable to bring on fatal fat embolism."

The article confirms that the tourniquet is the best method of preventing fat embolism.

8. Bürger, L.: Fat Embolism in Military Surgery, Med. Klin., Sept. 5, 1915, No. 36; abstr., The Journal A. M. A., Oct. 23, 1915, p. 1494.

THE EVOLUTION OF OSTEOCHONDRITIS DEFORMANS COXAE JUVENILIS *

ALBERT H. FREIBERG, M.D.
CINCINNATI

In 1905 I described[1] two cases of arthritis deformans coxae juvenilis whose chief clinical interest lay in the impossibility, at that time, of distinguishing them from adolescent coxa vara without the aid of the Roentgen plate. They were the first cases of the kind reported in this country, and the examination of the roentgenograms made it evident that we were dealing with deforming disease of the hip which must have been in existence for a long time and with whose early clinical phase we were totally unfamiliar. In both instances we were dealing with intelligent patients coming from excellent social environment, and it would be only fair to presume that we might rely on the accuracy of their statements with reference to the indefinite character of the symptoms which were present in the early stages of the disease. Both patients presented themselves with what was a finished deformity of the joint, to all intents and purposes, and both of them were under observation for over a year without material change in their condition, when the report was made. The title to this report seems to have been misleading, since I have been made to call these case adolescent coxa vara, by some who have quoted them. Although these cases had a history strikingly similar, the roentgenograms have, in the light of present knowledge, very striking differences. These differences have assumed a practical importance to me in view of additional experience. In the first case we were dealing with a boy of 14 years, and the Roentgen ray presented a deformity of the head of the femur best described by speaking of it as "mushroomed on the neck." The second case was that of a young man 22 years old, who had been aware of the condition since his sixteenth year; the roentgenogram showed here a deformity of the femoral head, such as is often seen in the so-called arthritis deformans of older persons, and which has been aptly likened to the shape of the glans penis. In both cases there was positive denial of any injury which could be of causative importance.

Fig. 1 (Case 1).—Roentgenogram of hips.

Since the report of these cases and those which preceded it, much progress has resulted in the study of the deforming hip disease of the young. This is most largely due to the work of Perthes, who in 1910 described the early symptoms and characteristic Roentgen-ray appearances of a disease involving

* Read before the Section on Orthopedic Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Freiberg, A. H.: Am. Jour. Orthop. Surg., July, 1905.

chiefly the upper epiphysis of the femur, and it was he who first brought these changes forward as ending finally in a deformation of the head of the femur and the acetabulum which had been spoken of as arthritis deformans juvenilis. Even though the deformity of the femur in its later stages bears much resemblance to that seen in the so-called arthritis deformans of adults, the disease which produces it in children and the changes seen in the roentgenograms nevertheless differ markedly from the disease of adults spoken of by Goldthwait as "hypertrophic" and by Nichols as "degenerative" arthritis. The most striking difference is seen in the absence of new bone formations, or osteophytes, in those portions of the joint peripheral to its bearing surface. In the symptoms, also, the disease of early life differs from that of the adult, being in the former of much milder character, and, indeed, often of such insidious course as to escape detection until the terminal deformity has been discovered. That these juvenile cases have in their earlier stages and in former years constituted largely the class of cases which we formerly regarded as mild hip tuberculosis seems today quite evident. It seems very clear now that we have found here the explanation of the remarkably complete restoration of function in cases of hip disease which were sometimes brought forward as evidence of the efficiency of this or that method of treatment or of some one's particular skill in applying it.

The identity of the disease accurately described by Perthes and which begins usually prior to the eighth or ninth year of life with a characteristic flattening of the capital epiphysis of the femur, and that condition seen in adolescence as a mushroom deformity of the upper end of the femur, seems today quite clear. It has been established by the roentgenograms of cases seen early in the disease and those taken years later during the adolescence of the same patients. Still more striking is the observation I have made in the first case which I present.

Fig. 2 (Case 2).—Roentgenogram taken January, 1907.

CASE 1.—The patient is a boy of 12 years, who came because of marked limp with flexion and adduction deformity of the right hip of one year's duration. Although there was little pain, there was distinct tenderness over the femoral head, and after a clinical examination, I thought I was dealing with the deformity of hip tuberculosis. Nothing was said concerning the left hip, and my clinical examination did not disclose any abnormality. The boy was otherwise apparently well, though undernourished and pale, and his temperature was 99 F. and over on several occasions. The roentgenogram was made of both hips (Fig. 1); the right hip showed typical flattening of the capital epiphysis. The epiphysis was quite dense with areas of increased radiability. The left hip, to my surprise, showed marked mushroom deformity of the head; the capital epiphysis was greatly reduced in height and increased in width. The mother, on being questioned, remembered a period of limping about six years before but had ascribed no importance to it. There was no history of trauma more severe than that usually to be found in active children. This case furnishes striking testimony to me, were further evidence required, that we are dealing with two phases of the same lesion, early and late. I do not mean, of course, to infer by this report that it is extremely rare to see this disease in bilateral form. Bibergeil, in a bibliographic summary, found ten reports of such cases.

I have, however, found two cases among my records which are still more instructive, to my mind, since they were carefully observed during a number of years. Furthermore, they were recorded at frequent intervals by Roentgen rays from a period near the inception of the disease to the time when the terminal mushroom deformity was presented in characteristic manner. Both cases were looked on originally as tuberculous, and the one which I shall present was roentgenographed regularly at intervals of three months during the whole active period of the disease. I look on it as offering certain important features in connection with the question of etiology and pathologic physiology.

CASE 2.—S. C. W., a boy 7 years of age, was brought to me in January, 1907. He was an unusually well-developed boy, very tall and heavy, with the appearance of robust health. The child of well-to-do parents, he was reared in a very favorable rural environment. In August, 1906, he began to limp without having had any injury of consequence, as far as his parents knew. Very soon after this he complained occasionally of pain in the groin and knee, of the right side. Still later there developed starting pains at night without later consciousness of suffering. He was still having distinct night cries when I examined him. At this time he was walking with a decided limp, standing with enough abduction to obliterate the right gluteal fold. There was one-half inch atrophy of the right thigh, and motion was limited in abduction, adduction and both internal and external rotation. The right hip was held in 7 degrees of flexion. There was tenderness over the femoral head and thickening about the neck. Some elevation of body temperature was always present on the numerous occasions when it was taken. No tuberculin test was made. The roentgenogram (Fig. 2) made at this time shows a typical flattening of the capital epiphysis of the femur, which is itself of greater than normal density, whereas there is some bone atrophy in the upper part of the neck.

At this time the boy was taken to Dr. V. P. Gibney for consultation, who concurred in my diagnosis of tuberculous disease and returned him to me for treatment. This consisted in the application of a traction brace with partial recumbency. Some time later he was brought with a condition of greater sensitiveness, and he was crying out quite often every night. He was therefore kept in hospital for several weeks in bed with traction, and was then sent home with a plaster spica and stilting brace. In May, 1908, the examination showed shortening of less than ½ inch, no night cries, and very little muscle spasm. The general condition was excellent. The roentgenogram made at this time (Fig. 3) shows, however, a marked change in the capital epiphysis; a piece appears to have separated distinctly from

its lateral third. There is no sign of disease in the acetabulum. The boy had been treated for some months by means of Marmorek's serum and was one of a series of cases reported by me for this reason. In October, 1909, the examination showed him to be in excellent condition, without pain, tenderness or spasm. There was complete range of motion in the hip except in rotations, where a few degrees of limitation persisted. The roentgenogram (Fig. 4) shows

Fig. 3 (Case 2).—Roentgenogram taken May, 1908.

a return of density in the capital epiphysis; the lateral part which seemed to have separated has apparently reunited. The epiphysis, however, is much flattened, and its lateral end is curved over the lateral aspect of the upper part of the neck. The acetabulum seems still unchanged. The boy was now permitted to go without any mechanical protection. He was seen from time to time during the year 1910, and was then dismissed from observation. In January, 1915, eight years after the first examination, he was again brought for examination because of a return of limping. This was not marked, and there was no pain. Limitation of motion was present in extremes of rotation only. The roentgenogram (Fig. 5) made at this time shows the typical mushroom deformity of the head with the flattened epiphysis.

Viewed in the light of present knowledge, it seems plain to me that this case must be regarded as of nontuberculous character, and that it belongs distinctly in the category of osteochondritis deformans juvenilis as described by Perthes. The symptoms which were present must be looked on, however, as much more severe than we are accustomed to observe in such cases. Even so, to me they now spell an affection of infectious or toxic character, of low grade. Such a case coming today, in its beginnings, would call for a careful search for an infection atrium, and I regard it as more than probable that its discovery in tonsils or elsewhere would result in cutting short the progress of the disease and very likely the further development of deformity.

It seems erroneous to me to hold that a case has been made out for the traumatic origin of this disease. In the cases which I have observed the history of injury has always been most indefinite and not to be brought into clear relationship with subsequent symptoms or even with the side of the body which we find affected. The development of the disease in the opposite hip at a later time without the occurrence of distinctly related trauma would seem also to speak emphatically against injury as a cause. On the other hand, I believe that a search backward into the early history of well observed cases would usually reveal symptoms of distinctly inflammatory nature, such as slight fever, local tenderness and muscle spasm, to say nothing of the distinct night cries which I have noted in the two cases mentioned. The cases of congenital luxation of the hip which have been forcibly manipulated and which are used by Legg in support of the theory of traumatic causation are not convincing to me. In them the trauma is more direct than we are able to determine in our cases of osteochondritis; on the other hand, cases of congenital luxation which have gone unreduced without attempts at replacement very often show a deforming process in the femoral head which is presumably due to the effect of continued abnormal function. I have shown this to be the case, in fact, with traumatic luxation in the adult which has remained unreduced for years.

It seems to me far better to assume, as an etiologic basis for osteochondritis deformans juvenilis, a chronic infectious process of probably secondary character, just as we do in explaining other deforming joint diseases of later life. The circulatory peculiarities on which Legg[2] lays stress may be used to explain the changes which take place, even more appropriately in connection with infection and its associated progressive character than with trauma. This accords with the vascular theory of Wollenberg with which I have been concerned in another paper.[3] Therefore, I feel that there is no occasion to change the name given to this disease by Perthes and that it should

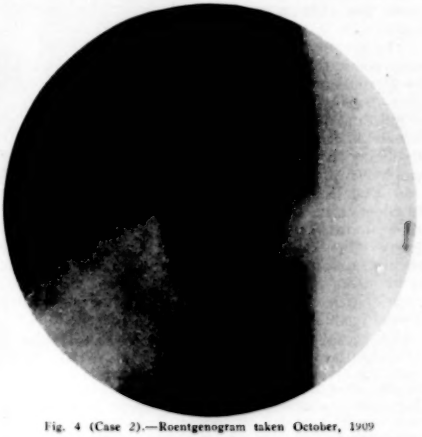

Fig. 4 (Case 2).—Roentgenogram taken October, 1909

remain until we can speak in more exact terms of its etiology and pathology. Thus far no cases have been continously followed by Roentgen-ray observations for a long enough time to determine what the truly terminal deformity really is or to what extent it may change during the later years of adolescence and adult

2. Legg: Surg., Gynec. and Obst., xxii, 307.
3. Compare Freiberg and Woolley: Am. Jour. Orthop. Surg., 1910, viii, 491.

life. On the contrary, it seems likely enough, in conformity with the observations of Preiser and others, that such a degree of disturbance of the joint mechanism will have as its result further deformity and disablement, as the years go on.

If these considerations are to be taken seriously, as based on reasonable premises, it would be fallacious to assume that because the symptoms are of mild character and because recovery with much joint motion may be expected, mechanical protection is unnecessary or unimportant in this disease. There is reason to believe that the terminal deformity is due to weight bearing and motion as much as in tuberculous disease, and the influence of the deformity in producing disablement many years afterward we do not even know. As the result of our errors in mistaking these cases for tuberculosis in past years, we know that long continued fixation of these hips does not interfere with the return of joint motion; for this reason I believe that this form of treatment should be patiently and carefully carried out. If at all to be modified this should perhaps be done to the extent of adding stilting to fixation. Finally I would urge again that in all future cases it should be incumbent on us to give our patients the most careful scrutiny in the earliest stage possible with a view to ascertaining the existence of focal infection, such as in the tonsils. If discovered early and given appropriate treatment, this would bid fair to save for our patients future disablement and deformity and to abbreviate greatly the course of the disease.

19 West Seventh Street.

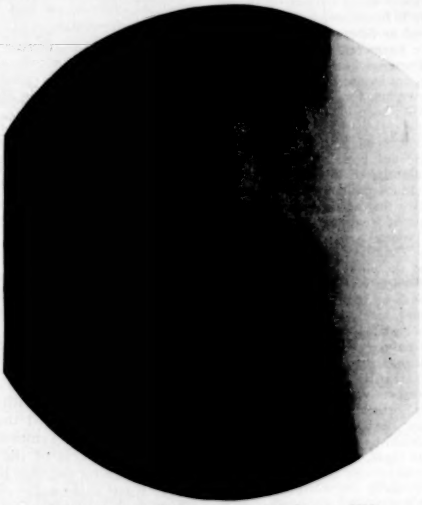

Fig. 5 (Case 2).—Roentgenogram taken January, 1915.

ABSTRACT OF DISCUSSION

DR. J. R. KUTH, Duluth, Minn.: Dr. Freiberg, in drawing attention to infection as an etiologic factor in this most interesting condition, touches on what is most important as related to treatment. Up to the present time, most attention has been given to the deformity itself, to late results in the hip joint, and to the amelioration of deformity by treatment. In the few cases that I have seen and have been able to study, the destruction of the head at the time of first examination (and this was the first time that these patients presented themselves for treatment) was so far advanced that one could hope for very little more than a further increase in the shrinking-up process of the splintered head. Among these cases was one which ran remarkably parallel to the one that Dr. Freiberg described as being probably a severer form of Perthes' disease.

In these cases I was left with the same impression as regards the infective origin as was Dr. Freiberg. The history of any injury was either denied or was so vague as to be valueless as a causative factor. It would seem that if we are to derive much benefit from treatment of the condition from the infective point of view, either in the eradication of a local focus or in the treatment of some distant focus, this should be done much earlier than the time we generally see these cases. Inasmuch as these cases come for treatment at a time when the disease is far advanced and the deformity established to the extent in which we generally see it, the disease can probably be correctly described as a self-limiting one, the best treatment being rest, fixation and weight removal. I did not understand Dr. Freiberg as saying that all cases of osteo-arthritis deformans of adolescence are due to a pre-existing Perthes' disease. It would seem, from the cases described by Maydl, Zesas, Frangenheim, Von Brunn and others, that there really are cases of what is known as osteo-arthritis deformans coxae of adolescence in which the individual may not have had a previous Perthes' disease. If we are to think that these were probably cases of Perthes' disease, the observations of the Germans regarding the previous history, the date of onset, and the pathologic findings at operation, would then be very misleading.

DR. FREDERICK C. KIDNER, Detroit: My support of Dr. Freiberg's theory of the infectious origin of the cases of so-called Perthes' disease is based on the study of only a single case. It was a typical case of osteochondritis juvenilis, except in two particulars. First, the child, in the beginning, had a slight fever, lasting three or four days. Second, when he went to the hospital, he had eleven thousand white cells with 80 per cent. of polynuclears. The roentgenogram was typical. The depression below the epiphyseal line was very plain, and there was one spot in the neck of the bone which closely resembled an abscess. I tunneled in through the greater trochanter, and opened a cavity just below the epiphyseal line, from which was obtained a low-grade staphylococcus, which died out in the second generation and could not, therefore, be used for guinea-pig inoculation. It seems, on the basis of this case alone, that many of these cases are due to hematogenous infection originating somewhere else, as in the tonsils. I wish, also, to make a plea for a longer and more persistent treatment of cases of Perthes' disease, because I think that many of the so-called "mushroom" hips of adult life originate in this disease.

DR. JOHN RIDLON, Chicago: I have a case which, from the roentgenographic findings, I believed to be a typical case of Perthes' disease, but which went on to the development of a typical tuberculous abscess. I am not yet certain that in Perthes' disease we really have a separate entity that can be diagnosticated with certainty.

DR. VIRGIL P. GIBNEY, New York: While Dr. Freiberg was describing the case in which he overlooked the other hip, I was reminded of two cases in young boys that I have seen within the last few years whose hips seemed to be going to pieces. Some men said they were tuberculous. I protested that they were not. An internist got hold of a rather stout boy, and treated the intestinal tract. The stools were examined, carefully and repeatedly, and bacteria far in excess were found, easily accounting for the infection. In a recent paper, Dr. Niles reported the boy's health restored, with restoration of function in both hips. I begin to feel as Dr. Freiberg does, that we are all at sea on our tuberculous hips; and I seem to feel hesitation in calling a case one of tuberculous disease without resort to laboratory tests. We may think it is that,

because of the symptoms; but we make no test; or, if we do, we say that this test is not always reliable, and we feel that we are not getting very far. With the aid of the intestinal specialist, the proctologist, the laryngologist and the dental surgeon, however, we may be able to find out the cause of infection. Many are said to be rabid on the subject of special tooth abscesses. We do not find them in children, but we find other foci of infection in the teeth of children. A laboratory for the study of dental diseases will be established in Columbia University within a short time. We should rely more on the pathologic findings in connection with accurate Roentgen-ray findings.

DR. HENRY LING TAYLOR, New York: A year ago I reported nineteen cases of Perthes' disease. The cases now number over thirty. There are several things quite evident from this and other material, and one is that the cases are not tuberculous. Another is that the statistics of tuberculous hip disease have been seriously vitiated by counting these cases among them; just as formerly they were vitiated by counting in cases of coxa vara. The latter condition has been separated from tuberculosis of the hip, and these cases will also have to be separated from it. I pointed out, a year ago, that Perthes' disease was the foundation of some cases of osteo-arthritis in adults; several such cases have been observed. These cases have practically all been diagnosed as tuberculosis of the hip; and even when the patients have recovered entirely from the disease, the fact that such a diagnosis has been made is a handicap to them. It was pointed out by one of them, a doctor, that he had to pay a higher premium for life insurance on account of his hip condition having been diagnosed as tuberculous, which it was not. In my series of thirty odd cases, several were ushered in with symptoms suggestive of infection. Several others followed trauma; but both of these classes together constitute but a small minority of the whole number. The treatment needed is very much milder than that for tuberculosis. I have seen one case that seemed absolutely to demonstrate the evil effect of routine treatment on orthopedic lines. The case was that of a young boy whose symptoms began over four years ago. The condition was diagnosed as tuberculosis of the hip joint and the child was treated with the long traction splint. The affection was certainly Perthes' disease, and the child now has over an inch and a quarter of shortening, of which one inch may safely be ascribed to the long continued suspension of the limb. I feel, therefore, that it is an error to overtreat these cases.

DR. ALBERT H. FREIBERG: With regard to the cases reported by earlier observers as cases of arthritis deformans of traumatic origin, I went over these reports very carefully. In the cases of von Brunn, particularly, osteophytes are described; but a careful examination of his illustrations fails to show that what he calls osteophytes should be so considered, in the light of what we now know about these, in deforming disease of the hip joint. They are irregularities of bone, but not new bone-formations, which we mean by the word osteophyte. At the same time, the reproductions are by no means excellent in the works referred to; and it is possible that if I had the original negative or the original prints, I might come to the opposite conclusion. The histories are not characteristic. There is no convincing evidence that any severe injuries happened to the children. That a child had a fall and later developed symptoms, is just the kind of history we hear today in regard to tuberculosis of the joints, and does not prove an etiologic relation. We must be careful about the effects of our treatment in these cases. We are prone to feel that if, after a year or so, there is an apparent return to normal function, and there has been no loss of motion or length, the case is to be considered as finished; but the examination of the one case which I have reported shows that we are in no position to say what the end results will be in eight or ten years, so we shall have to be careful in coming to the conclusion that a case is ready to be released from treatment. How an excess of protection can result in loss of length in a limb, is difficult to understand, except when the treatment happens to deprive the limb of function. In the same way, in many cases of infantile paralysis the shortening is due to lack of use. I should like to see such cases submitted to weight-bearing to some extent, rather than to the amount of protection that we have been using for tuberculous disease.

ELECTIVE LOCALIZATION OF BACTERIA IN DISEASES OF THE NERVOUS SYSTEM *

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Many bacteria retain for a long time the peculiar properties which determine their characteristic localization. The importance of studying the infecting power of some in which these properties are less fixed has not been sufficiently considered.

Some years ago I showed that the common occurrence of endocarditis in animals following intravenous injection of a staphylococcus from endocarditis and numerous strains of *Streptococcus viridans* from chronic infectious endocarditis depended to a certain extent on clump formation, and that simultaneously with the disappearance of this property, both from artificial cultivation and animal passage, endocarditis failed to develop.[1]

The importance of making injections soon after isolation of the bacteria was emphasized at that time. In 1909 Lewis and the writer[2] reported the isolation of a diplococcus from the thrombus in the portal vein in primary portal thrombosis, which produced retrograde thrombosis in radicles of the portal vein in a rabbit following intravenous injection. The full significance of the results of the animal experiments, however, was not realized at the time.

During my studies on the transmutation of pneumococci and streptococci[3] in which relatively avirulent strains were made virulent by successive animal passages, and highly virulent strains less virulent by cultivation, marked changes in localization following intravenous injection in animals were noted. At certain lower grades of virulence, endocarditis, arthritis, cholecystitis, ulcer of the stomach, myositis and iritis, respectively, occurred, while when the virulence was high, hemorrhages and edema of the lung and bronchopneumonia commonly occurred. The latter observation is in accord with the results of Wadsworth.[4] The results suggested the possibility that diseases of widely different symptomatology might be due to strains of bacteria of the same or closely related species, but having peculiar localizing or infecting powers. Since then systematic cultures in which there was afforded a gradient of oxygen pressure have been made from diseased tissues in a series of diseases.[5] Streptococci frequently very sensitive to oxygen have been isolated in many instances from the involved tissues, often to the exclusion of other bacteria in rheumatic fever, arthritis deformans, appendicitis, ulcer of the stomach, cholecystitis, and myositis, and a diphtheroid-

* Read before the Section on Practice of Medicine at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Rosenow, E. C.: Immunological and Experimental Studies on Pneumococcus and Staphylococcus Endocarditis, Jour. Infect. Dis., 1909, vi, 245; Immunological Studies in Chronic Pneumococcus Endocarditis, Jour. Infect. Dis., 1910, vii, 429; Further Immunological Studies in Chronic Pneumococcus Endocarditis, New York State Jour. Med., 1912, xii, 441; Experimental Infectious Endocarditis, Jour. Infect. Dis., 1912, xi, 210.

2. Lewis, D. D., and Rosenow, E. C.: Primary Portal Thrombosis, Arch. Int. Med., 1909, iii, 232.

3. Rosenow, E. C.: Transmutations Within the Streptococcus Pneumococcus Group, Jour. Infect. Dis., 1914, xiv, 1.

4. Wadsworth, A. B.: Studies on Pneumococcus Infection in Animals, Tr. Assn. Am. Phys., 1912, xxvii, 72; Pneumonia; a Bedside and Laboratory Study, Am. Jour. Obst., 1909, lix, 1080.

5. Rosenow, E. C.: The Newer Bacteriology of Various Infections as Determined by Special Methods, THE JOURNAL A. M. A., Sept. 12, 1914, p. 903.

like streptococcus from the erythematous node in erythema nodosum. The streptococci from rheumatic fever and erythema nodosum especially showed a preference for partial anaerobiasis. Intravenous injection soon after isolation of these strains and commonly those from the respective focus of infection often showed a most marked tendency to localize electively in the tissues in animals corresponding to those involved in the spontaneous disease.[6] The lesions were truly elective in many instances. They approximated in type those of the spontaneous disease. The elective property or peculiar tropic condition of the streptococci in the foci of infection was undoubtedly an important factor in producing the diseases studied. The suggestion that other diseases whose etiology was still obscure might have a similar origin was at hand.

By the use of the same or similar technic, verification of the results in ulcer have been brought forward by Gerdine and Helmholz,[7] Hardt,[8] and Moody.[9] The results in iritis have been verified and extended by Irons, Brown and Nadler.[10]

In this paper I wish to summarize briefly the results of an experimental study of the possible etiologic relation of localized foci of infection, especially in and about the teeth and tonsils, to diseases of the nervous system. The technic used was similar to that previously described. Owing to the wealth of material at my disposal in the Mayo Clinic and the willing cooperation of the patients and the members of the staff, favorable cases were selected for investigation. Effort was made to obtain bacteria for cultures from the depth of the focus by expressing the infected material from tonsils with a laryngeal mirror, and by aspirating the infected pockets about teeth with a sterile pipet. In the former it commonly happened that abscesses were ruptured, even in tonsils which appeared quite normal on the surface. These were usually situated in the pole of the tonsils. Tonsillectomy and extraction of teeth were done when indicated.

The cultures for injection were usually incubated at 33 C. in tall columns of ascites-dextrose broth (affording a gradient of oxygen pressure), for from eighteen to twenty-four hours, centrifugalized in the containers in which they were grown, the supernatant broth saved for filtration and for injection of animals, and the sediment suspended in sodium chlorid solution, so that 1 c.c. represented the growth from 15 c.c. of the broth culture. Animals of different species were injected, often in series, with doses ranging generally from 1 to 3 c.c. of the suspension for rabbits and guinea-pigs, and from 0.25 to 1 c.c. per kilogram of weight for dogs and goats. In many experiments smaller doses of the broth culture without centrifugalization were injected. In some the bacteria from emulsions of the tonsils and suspensions of the material expressed from the tonsils were directly injected.

Part of the material obtained from the patient was plated out and incubated on human blood agar, aerobically and anaerobically. Smears and inoculations on blood agar plates were made as a routine of the broth cultures and suspensions at the time of injection. In most instances the bacteria from the primary culture in the broth were injected. These cultures often contained a mixture of bacteria, but usually showed a great preponderance of streptococci and in some instances pure cultures of streptococci. While it was the rule to inject the bacteria from the primary cultures in broth, injections were made in some instances of pure cultures from single colonies on blood agar plates or from

ELECTIVE LOCALIZATION OF STREPTOCOCCI AND STAPHYLOCOCCI IN THE NERVOUS SYSTEM

Source of Bacteria	Strains	Animals Injected	Appendix	Stomach or Duodenum, Ul.	Stomach or Duodenum, Ul.	Gallbladder	Liver	Pancreas	Intestines	Joints	Endocardium	Pericardium	Myocardium	Muscles	Kidney	Lung	Skin	Teeth	Nerve trunks	Meninges	Spinal cord	Brain	Dorsal roots
Multiple sclerosis	3	21	0	6	3	10	3	3	0	13	3	3	6	29	23	3	0	0	0	23	16	13	0
Sporadic anterior poliomyelitis	1	36	0	17	0	3	6	0	3	8	0	6	3	14	31	0	3	0	19	25	78	14	0
Transverse myelitis	1	21	5	24	19	0	0	0	35	14	14	10	14	24	10	10	5	0	5	80	67	24	0
Neuralgia	4	18	0	6	0	6	6	0	0	11	22	0	6	32	6	22	29	0	28	22	6	0	33
Multiple neuritis	1	19	11	11	0	5	0	0	11	22	5	16	11	37	16	22	0	0	79	0	16	5	0
Myositis and dental neuritis	1	24	0	13	0	8	3	0	0	4	13	0	4	71	13	0	0	88	46	0	0	0	0
"Myalgia"	12	29	3	10	14	3	3	0	0	48	24	0	28	83	17	3	3	0	7	7	3	3	0
Average incidence of lesions exclusive of specific strains			3	12	6	5	3	0	7	12	12	5	7	27	17	15	6	0	12	13	4	3	0

lesions and blood of animals. It is noteworthy how promptly the nonpathogenic or saprophytic bacteria disappear in animals.

The particular micro-organism responsible for the lesions in animals when mixtures were injected was determined by demonstrating its presence in the lesions and its absence in normal tissues (and blood) by means of cultures and sections, and by again producing similar lesions on reinjection of the pure culture.

In the table is given a summary of the results obtained in animals. The figures indicate the percentage incidence of focal lesions in the various organs. In a few instances the figures only approximate the actual occurrence of lesions in various organs because they were not looked for in all the animals injected, the pulps of only four to six teeth and approximately three fourths of the spinal roots were examined as a routine for lesions. Lesions in the liver, spleen, thyroid, lymph glands, tonsils, tongue, parotid, eyes and reproductive organs occurred so rarely that they are not included in the table. In the last line is given the percentage incidence of lesions in various organs exclusive of the specific strains. These figures serve as a basis for comparison. They correspond in a general way to those given in my previous table.[6] The incidence of arthritis, however, is less, while the incidence of myositis is greater. The latter is due to the fre-

6. Rosenow, E. C.: Elective Localization of Streptococci, THE JOURNAL A. M. A., Nov. 13, 1915, p. 1687.

7. Gerdine, L., and Helmholz, H. F.: Duodenal Ulcer in Infancy an Infectious Disease, Am. Jour. Dis. Child., 1915, x, 397.

8. Hardt, L. L. J.: The Secretion of Gastric Juice in Cases of Gastric and Duodenal Ulcers, Am. Jour. Physiol., 1916, xl, 314.

9. Moody: Personal communication to the author.

10. Irons, E. E., Brown, E. V. L., and Nadler, W. H.: The Localization of Streptococci in the Eye. A Study of Experimental Iridocyclitis in Rabbits, Jour. Infect. Dis., 1916, xviii, 315. The apparent inability of some to corroborate these and the results on the transmutation work appear explainable as due to differences in technic and differences in the character of strains studied.

quent injection of slightly hemolyzing streptococci which commonly localize in muscles.

Lesions of the spinal cord, usually patchy in character, were observed in 58 per cent. of thirty-one animals injected with the bacteria from the tonsils or infected teeth in three cases of multiple sclerosis. In one of these the lesions appeared to be due to a staphylococcus; in the other two, to a green-producing streptococcus. Markedly increased reflexes, ataxia and paraplegia were noted during life in some of the animals. None became paralyzed. The duration of symptoms in the patients ranged from three to eight years. In two additional cases little evidence of local infection was found and the cultures failed to produce lesions in the spinal cord.

Lesions of the spinal cord, consisting of numerous hemorrhages, especially in the anterior horns in the cervical region, were noted in 78 per cent. of thirty-six animals injected with the staphylococcus from the tonsil in a typical case of sporadic anterior poliomyelitis. Many of these developed partial or complete paralysis, more marked in the anterior extremities, both after intravenous and intracerebral injection of pure cultures and of emulsions of diseased cords. Several dogs showed marked improvement in motive power, and some obtained a complete restoration of movement. The lesions in the cord are quite different from those in epidemic anterior poliomyelitis.

Lesions of the meninges and spinal cord occurred in 50 per cent. and 66 per cent. of twenty-one animals injected with the bacteria as isolated from the pyorrheal pockets and tonsils in a case of transverse myelitis with paralysis of the lower extremities. Partial or complete paralysis, which began in the hind extremities, developed in many of these animals. The lesions of the cord consisted chiefly of hemorrhages both in the gray and white matter and of leukocytic infiltration in the meninges and surrounding the blood vessels.

The occurrence of the two types of paralysis, following injection of the bacteria from these two cases, was a striking picture. It was difficult, and in some instances impossible, to demonstrate bacteria in the areas of hemorrhage showing little or no leukocytic infiltration in the substance of the cord. They appeared to be infarctions from partial or complete thrombosis of the small blood vessels remote from the area of hemorrhage. This was true alike following injections in multiple sclerosis, anterior poliomyelitis and transverse myelitis. The bacteria were found in large numbers in the areas of infiltration in the meninges and surrounding blood vessels in transverse myelitis. These findings are in accord with the fact that bacteria are rarely findable in acute myelitis in man, and hence the lesions are thought to be toxic in origin or due to filterable viruses.

Lesions in or about one or more of the posterior roots occurred in 83 per cent. of eighteen animals following injection of streptococci from cases of brachial, intercostal and postherpetic neuralgia. The occurrence of neuritis in 28 per cent. of these animals is noteworthy. This and the high incidence of lesions in the skin, 28 per cent. (chiefly herpes), occurred in animals injected with relatively large doses. As far as can be determined this is the first experimental demonstration of the probable nature of this form of neuralgia.

Lesions of the peripheral nerves occurred in 79 per cent. of the nineteen animals injected with the pneumococcus obtained on two occasions from multiple neuritis. In one rabbit typical wrist-drop developed. The animals seemed to be in pain. The lesions consisted of localized hemorrhages, edema and leukocytic infiltration, in which often many diplococci were found. The localization of the slightly hemolyzing streptococcus isolated from the dead pulp of a tooth and excised muscle from the neck in a case of myositis and dental neuritis was unique: 71 per cent. of the twenty-four animals injected showed myositis, 50 per cent. dental pulpitis, and 46 per cent. neuritis, chiefly of the dental nerves.

Lesions in or about the joints occurred in 48 per cent. of the twenty-nine animals injected, in the myocardium in 28 per cent., and in the muscles in 93 per cent., following injection of the cultures (all containing slightly hemolyzing streptococci) from the twelve cases of "myalgia" (cases of fibrositis or mild myositis, with or without periarthritis). These were included in this table to show the contrast in distribution of lesions and because in some cases it appeared that some of the pain was due to mild neuritis.

It must not be supposed that the lesions observed were slight or temporary, that they were always the result of the injection of large doses (even the small amount of exudate expressed from tonsils when directly injected was sufficient to produce the lesions in some instances), or that they were usually a part of a generalized fatal infection (62 per cent. of the animals recovered and were chloroformed for examination). Localizations strikingly like those in the patients were obtained in many animals of different species with the bacteria as isolated, but not with the same strains after cultivation for a time or after a number successive animal passages. In those strains in which the elective property was marked, the characteristic localization occurred in nearly all the animals injected intravenously and in a high percentage of those injected intraperitoneally. Numerous strains from other sources and the filtrate of the broth cultures of the strains as isolated have failed to cause similar lesions. These and other facts preclude the possibility that the lesions in the animals were from spontaneous or accidental causes.

The conclusion seems warranted that the lesions in the patients studied were due to hematogenous infection from a focal source by the bacteria isolated. The improvement in symptoms following removal of foci of infection which were proved to harbor bacteria with peculiar localizing powers in multiple sclerosis, transverse myelitis, several cases of persistent neuralgia (although not in others), and in the case of dental neuritis and myositis speaks in favor of this view. The results emphasize the importance of thorough search for, and removal, if possible, of foci of infection in diseases of the nervous system. In the light of these results and much clinical evidences, as emphasized especially by Billings, a chronic focus of infection which cannot heal for mechanical reasons, often teeming with bacteria, must be considered as a test tube with a permeable wall embedded in the tissues, which, as I have already pointed out,* affords not only abundant opportunity for the entrance of bacteria and their products, but also the conditions favoring the acquisition of various infective powers by the bacteria. The demonstrated presence over a long period of time in foci of infection (particularly in chronic diseases) of bacteria with the same elective localizing powers suggests that the tendency to recurrences of a certain type of disease in the same patient and even hereditary tendencies may be due in part to the peculiar environ-

ment furnished by the individual which may favor the acquisition and maintenance by the bacteria of a particular infecting power.

Too much benefit should not be expected from the removal of evident foci of infection, because a similar condition may be present in inaccessible foci and in others too small to be detected. Moreover, recovery may be made difficult by local tissue sensitivity or peculiar mechanical conditions, and living bacteria in a metastatic lesion may continue the process independently of the focal source. In the case of dental neuritis and myositis the focus was found in the pulp of a dead molar tooth, no demonstrable lesions being found in the jaw. The removal of the tooth, while helpful, was not followed by the prompt disappearance of the symptoms. Streptococci demonstrated in sections of the excised muscle from the neck were proved alive ten days after a typical recurrent attack of spasm and pain.[11]

ABSTRACT OF DISCUSSION

DR. FRANK BILLINGS, Chicago: When one discusses the subject of localized infection he ought to know the particulars of it and discuss it from the side of an infectious organism and all that relates to it. One should also discuss the host and the reaction of the body. This, however, is neither the time nor the place. The organisms infecting the body invade us, living as parasites harmful or harmless to the host. The organisms may act directly on certain tissues, lodge in them, multiply and produce reactions which are not always the same. We have recognized that the pathogenic micro-organism may possess a tropism for tissues, but have not appreciated the importance of this principle of bacteriology. One may conceive that the agents infecting some particular tissue like a joint may gain tropism for that kind of tissue; and if isolated and injected into an animal the same tissues will be infected in the injected animal. The work that Dr. Rosenow has done is proof that tropism may be gained in the infected tissues. The *Streptococcus viridans* may have an elective affinity for the heart and at another time an affinity for muscles or joints. There are many things we cannot explain. There are certain biochemical changes that occur due to reactions of the organism in the tissues. The phenomenal work that Dr. Rosenow and others have done has been due to the fact that they were able to come in contact with the patients. They have been able to be at the bedside and to use the patients as material. The first work done by Dr. Rosenow was in the wards of the Presbyterian Hospital. We never removed tissues from a patient without his consent or request. In chronic conditions we may find many parasitic organisms in the tissues. They were disregarded and only strains were used that were proved to be pathogenic. Finally, we have come to know that many conditions formerly thought to be noninfectious are infectious.

DR. ERNEST ZUEBLIN, Baltimore: Dr. Rosenow's demonstration of the tropism of muscular tissue against certain bacterial strains may give us an explanation why we so frequently find the muscular system affected. For the clinician, the physician interested in dispensary work and the routine practitioner the frequency of chronic myositides, of interstitial infiltrations and nodosities encountered in the larger muscles (neck, etc.) is striking. Although among Swedish and Dutch physicians this type of muscular rheumatism is well known and successfully treated, among the general practitioner such findings obtained only by a careful physical examination are too often neglected. We all are aware of the tedious task to improve these chronic ailments, which left alone get worse and result in permanent injury. Any new experimental data in the line of Dr. Rosenow's work, showing an affinity of bacteria toward the muscular elements, must be followed with great interest as a possible way for better diagnosis, prognosis and treatment of such ill defined cases. From the experimental standpoint I would like to ask Dr. Rosenow if there is any possibility to increase that tropic affinity of the bacteria by the addition of certain organ extracts to the culture media, and if such a thing is possible what percentage of organ extract is permissible for obtaining the best culture result.

DR. SAMUEL JAMES MELTZER, New York: Dr. Rosenow's observations are certainly very striking and probably practically important. They are so striking that a great many bacteriologists and clinicians look at them with some suspicion. But Dr. Rosenow is in the fortunate position that the minority which believes in his results is composed of men who had the chance to see his experiments. The question is: how can it be explained that infections, localized in various organs, could be specifically produced by one and the same type of an organism, namely, by the streptococcus. Various explanations occurred to my mind. In the first place, that streptococci which may look alike and which may give even certain similar reactions, may nevertheless be fundamentally different. There are a great variety of species or sub-species among the streptococci; we only do not yet possess the means of recognizing their individualities. That would mean that, for instance, infections of the appendix and gallbladder, etc., are really produced by definitely different sub-species of streptococci. A second explanation may be the assumption that the streptococci are merely constant companions of certain specific organisms, not yet known to us; the discovery of the ameba as the cause of pyorrhea alveolaris is an illustration. There is a third possible explanation. It is based on the conception of the *locus minoris resistentiae*, the importance of which in pathology was impressed on me some twenty years ago in experiments carried out by Dr. Cheesman and myself. We found then that the intravenous injection of organisms, streptococci, for instance, had hardly any influence on the experimental animals. However, we could find at any place in the animal body the specific organisms in pure culture when we, previous to the injection, caused a slight lesion in that place. We thus localized these organisms in circumscript places: the liver, the parietal peritoneum, the uterine mucosa, etc. Now the *locus minoris resistentiae* may be considered from two points of view. One is that locality possesses a diminished resistance to *all* parasitic organisms; and the other is that this locality is less resistant to an organism which acquired a specific virulence for this tissue. It is the latter form of *locus minoris resistentiae* which I wish to apply to the observations of Dr. Rosenow. It is admissible to assume that specific organisms which are residing for a longer period in a certain tissue reduce considerably the natural resistance of this tissue to the virulence of that specific organism or rather increase the virulence of that organism to the specific tissue. When such an organism is now injected into a normal animal, that organism will show a greater virulence to the corresponding tissue in the new animal. It is, for instance, thus possible that a strain of streptococci which was obtained from a case of appendicitis acquired a higher virulence specifically to the tissues of the appendix. The intravenous injection of such an organism may, therefore, produce appendicitis and no lesions in any other organisms.

DR. G. CANBY ROBINSON, St. Louis: The elective localization of bacteria is an interesting conception, and has a very important bearing on the question of etiology of disease. Many of the conditions that have been discussed by Dr. Rosenow have a nonspecific etiology, the localization of the infection rather than the type of organism being responsible for the disease produced. But this theory should not be made to play a rôle in the causation of diseases resulting from specific infections. Surely Dr. Rosenow does not believe, for instance, that he has produced true acute anterior poliomyelitis in animals by injecting a streptococcus or staphylococcus which he obtained from the tonsils of a patient with this disease. It is fair to claim that the organisms infected, localized in the cord and meninges of the animals, but this

11. The details of the clinical histories and the experiments, a review of the literature, and a more detailed discussion of the significance of the findings, are reserved for separate papers.

localization does not constitute poliomyelitis as the term has been adopted to apply to a definite, clear cut clinical entity, caused by a filterable virus quite different from bacteria of the ordinary type.

DR. HENRY ASBURY CHRISTIAN, Boston: In analyzing the remarkable work of Dr. Rosenow we can make something like this subdivision: There are groups of cases with local lesions from which local lesion organisms can be isolated and when injected into animals these organisms localize in them at the same place from which they were isolated in the patient. From the appendix, in appendicitis, organisms may be isolated and if injected into animals they localize in animals at the same place in a predominating number of cases. It seems to be like the homing instinct of pigeons. Then there is another group of cases which present this difference. They are cases in which the organism is isolated from a focus that is not a part of the disease. The organisms isolated from such a focus if injected into animals localize themselves not in tissues which are similar to the tissues from which they were isolated but in tissues corresponding to the tissues involved in the general disease. This applies in Dr. Rosenow's case of multiple sclerosis, a disease of the central nervous system. Here the organisms are isolated from the tonsil but in animals localize in the central nervous system. I should like Dr. Rosenow to give us some idea why it is that an organism isolated from the teeth or tonsil will localize in the central nervous system rather than in the tonsil or teeth. These are two groups of cases which cannot be explained directly in the same way. In the second group the organism maintains the quality of localizing when injected into animals in certain tissues although it has not been localized in the body of the patient in that particular place. In cases of multiple sclerosis the organism must have been long present in the patient's tonsil without losing its power of localizing in the central nervous system. In conclusion I would like to express my appreciation of the tremendous amount of experimental work that Dr. Rosenow has done and which has thrown much light on this subject.

DR. EDWARD C. ROSENOW, Rochester, Minn.: The importance of injury from accidental causes as a determining factor in localization of bacteria as raised by Dr. Meltzer, is fully appreciated. The nature of the lesions observed, their location, and the incidence of their occurrence, as well as the care and individual caging of animals, precludes the possibility that injury from accidental causes had anything to do with the localization of the bacteria in these experiments. The "warning note" raised by Dr. Robinson is, I feel, superfluous, but it gives me opportunity to emphasize that the case of anterior poliomyelitis was not of the epidemic type, but sporadic anterior poliomyelitis, and that the elective property or peculiar tropic condition of the bacteria is, of course, only one of a number of factors determining their localization. Dr. Christian's questions are much to the point. I have repeatedly emphasized the fact that the bacteria having elective properties in the diseases which I have studied, do not usually produce inflammation of tonsils sufficient to cause subjective symptoms of tonsillitis, and that when the diseases studied occur in association with tonsillitis, they occur commonly some time after the height of the attack. The pus or other exudate containing the bacteria having elective affinity is not from actively inflamed tonsils, but usually from small atrophic tonsils with deep pockets which cannot heal for mechanical reasons, and which are virtually test tubes with a permeable wall. The bacteria in these tonsils are virtually outside the tonsil and, hence, should not be expected to localize in the tonsils of animals. It is impossible to say definitely at present on what factors the acquirement of elective properties depends. Chronic foci of infection, such as the above, however, appear to furnish conditions favorable not only for the entrance of bacteria, but for them to acquire varying infecting powers. It was thought more important to determine first to what extent localization of bacteria depended on peculiar properties of the microorganisms at hand, and then to study more closely the exact mechanism involved. This study is now in progress. While other factors, such as varying degrees of resistance and other peculiarities in animals normally present or produced experimentally, are of importance in determining localization of bacteria, it appears from this study, in which due regard is paid to the question of oxygen pressure, the proper nutrition and the early injection of animals, that the diseases studied are due in some instances to common pathogens, but which have acquired peculiar infecting powers.

POLIOMYELITIS

WITH SOME OBSERVATIONS ON THIRTY CASES

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As long ago as 1865, Taylor,[1] in referring to infantile paralysis, said, "There seems to be no doubt that this disease is much more frequent now and is rapidly increasing." It was not until 1881, however, that the first epidemic was described. This was reported by Bergenholtz, and consisted of eighteen cases in northern Sweden.

Since the Vermont[2] epidemic of 1894, there have been at least fourteen epidemics of poliomyelitis carefully recorded in different parts of the United States. These have varied in both size and intensity, and have been scattered across the country from Massachusetts[3] to California. Previous to the present epidemic, the largest number of cases was observed in the Swedish epidemic (1,031 cases) of 1905, and in the Pennsylvania epidemic (1,000 cases) of 1910. It is easily seen, therefore, that the 1916 epidemic, which has already exceeded 5,000 cases in New York with no indication of abatement, has long since dwarfed all previous records for this crippling and often fatal disease.

Not until Wickman's[4] report of the Swedish epidemic of 1905 was it shown that acute poliomyelitis is conveyed from person to person. Wickman further indicated that healthy persons may act as carriers. Nevertheless, with our present knowledge, it is out of the question to identify all carriers, if they exist; in fact, we do extremely well if we are able to recognize abortive cases when they occur.

We come, then, to what is the most difficult problem concerning this disease, namely, appropriate and successful means for checking its spread. Since it is generally conceded that poliomyelitis is not, under ordinary conditions, spread by water, milk or food, and that, in most instances, it is conveyed by direct contact, it would seem that the sole means for adequate control is by compulsory hospitalization at the earliest possible moment. We believe that through the prompt and energetic measures along this line adopted by Chicago's commissioner of health, another epidemic of this dire malady may have been averted.

Since poliomyelitis spreads along the lines of travel, all incoming passengers from the East are inspected for evidence of this disease. Physicians and any oth-

1. Taylor, Charles Fayette: Infantile Paralysis, Philadelphia, J. B. Lippincott Company, Philadelphia, 1867.
2. Caverly, C. S.: History of an Epidemic of Acute Anterior Poliomyelitis, Tr. Vermont State Med. Soc., 1894, p. 240.
3. Infantile Paralysis in Massachusetts during 1910, Month. Bull. Massachusetts State Board of Health, 1911.
4. Wickman, Ivan: Acute Poliomyelitis, Nervous and Mental Disease Monograph Series, No. 16, New York, 1913.

ers having knowledge of a known case are required to report it to the commissioner of health, and all doubtful or suspected cases are investigated by physicians of the city health department. When the diagnosis is definitely established, the patient is removed to the hospital by a health department ambulance.

The cases in our series, as presented in Table 1, were with a few exceptions of a mild type. Cases 19 and 25 we classed as of the encephalic variety, all the rest being spinal. It will be noted that the youngest patient was 5 months of age and the eldest 11 years, and that there were but two patients more than 5 years of age; 86⅔ per cent. of the patients were under 5 years of age. The sexes were almost equally divided, there being fourteen boys and sixteen girls. One point particularly observed by us was the fact that practically all the children were fair haired. A few had light brown hair, but they usually had blue eyes. There was really but one dark complexioned child in our recorded thirty-four instances in which there was the history of a fall.

There was no retention of urine in any of our cases, nor was there any bowel difficulty. Neither was photophobia observed in any instance. Drowsiness, however, was a common symptom in the early stage. As usual, in the cases of those attacked by poliomyelitis, our patients were, with few exceptions, not only well nourished, but exceptionally robust infants and children.

In determining the mode of treatment of acute poliomyelitis, the contagious nature of the disease is necessarily a matter of prime importance. Nevertheless, the degree to which this disease is contagious is a very uncertain quantity. Based on Frost's[6] estimates, the contagiousness of this disease is one-third that of scarlet fever and about one-half that of diphtheria. In reaching this conclusion, however, Frost includes the clinically doubtful cases.

TABLE 1.—OUTLINE OF CASES*

Case Number	Type	Age, Years	Sex	Complexion	Nourishment	Date of Onset	Date of Admission	Other Children in Family	Other Cases in Family	History of Injury	Large Tonsils	Paralysis					Pain	Tenderness	Max. Temp. in Hospital	Rigidity of Neck	Pain on Flexion of Spine
												Right Arm	Right Leg	Left Arm	Left Leg	Face					
1	S	1¼	F	P	G	6/28	7/ 3	...	0	..	0	0	+	0	0	0	0	0	99.6	0	0
2	S	3½	F	M	G	7/ 5	7/10	3	0	..	0	0	Pa.	0	0	0	++	++	99.6	+	+
3	S	2	F	P	G	6/27	7/10	3	0	..	0	+	0	Pa.	0	0	0	0	100.2	0	0
4	S	3½	F	M	M	7/ 6	7/14	...	0	..	0	0	0	0	+	0	+	+	99.4	0	0
5	S	3	F	P	G	7/11	7/18	...	†	†	0	0	0	0	+	0	0	0	100.2	0	0
6	S	11	M	M	G+	7/ 6	7/18	2	†	†	+	0	0	0	+	0	0	0	99.2	0	0
7	S	3½	F	M	G	7/14	7/19	...	0	..	+	0	0	0	+	0	+	+	99.4	0	+
8	S	2	M	P	P	?	7/20	...	0	..	+	0	0	0	0	0	0	0	99.8	0	0
9	S	3½	F	M	P	G	7/16	7/21	...	0	..	+	0	0	+	0	+	+	99.6	0	+
10	S	3½	F	M	P	G	7/15	7/22	6	0	..	+	0	0	+	0	+	+	99.6	0	+
11	S	4½	F	P	P	G	7/15	7/22	2	0	..	+	0	Pa.	+	0	+	+	99.8	0	+
12	S	3½	F	P	P	F	?	7/23	...	0	..	+	0	0	+	0	+	0	99	0	0
13	S	2	F	M	P	G	7/14	7/23	1	0	..	+	0	0	+	0	0	0	99.4	0	+
14	S	6	M	M	L.B.	G	7/16	7/23	4	0	..	+	0	0	+	0	+	+	98.8	0	+
15	S	5	M	M	F+	G	7/16	7/24	0	0	0	+	0	0	+	++	+	+	99.4	+	++
16	S	2	F	P	P	G	7/17	7/24	...	0	..	+	0	0	+	+	0	0	98.2	0	0
17	S	3½	F	M	P	P	7/ 4	7/24	3	0	..	+	0	0	+	0	0	0	99.2	0	0
18	S	1½	F	P	P	P	?	7/24	...	0	..	+	0	0	+	0	+	+	99	0	0
19	En.	5	F	P	D	G	7/21	7/25	0	0	0	+	0	0	+	+	+	+	99.8	0	0
20	S	3½	F	M	P	F	?	7/25	...	0	0	+	Pa.	+	Pa.	0	+	+	100	++	++
21	S	1	F	P	P	P	?	7/25	...	0	..	+	0	+	Pa.	0	+	+	100.2	0	+
22	S	5 mo.	F	P	P	G	7/12	7/26	2	0	0	+	+	+	0	0	+	+	99.6	0	+
23	S	1	F	P	P	G	7/12	7/26	...	0	..	+	0	0	+	0	+	+	101	0	+
24	S	3½	F	L.B.	P	G	7/19	7/26	...	0	..	+	0	0	+	0	+	+	101	+	+
25	En.	2½	F	L.B.	L.B.	F	7/20	7/27	...	0	..	+	0	0	+	+	+	+	98.6	0	0
26	S	4	M	M	P	P	7/25	7/28	3	0	0	+	0	0	+	Pa.	+	+	101.4	+	+
27	S	2	M	M	P	P	7/21	7/28	3	0	0	+	0	0	+	+	+	+	101.4	+	+
28	S	2	M	M	P	G	?	7/29	0	0	0	+	0	0	+	0	+	+	99.4	0	+
29	S	3	F	M	P	G	7/26	7/30	2	0	0	+	0	0	+	0	+	+	100.8	+	+
30	S	5	F	P	G	G	7/24	7/30	4	0	..	+	0	0	+	0	+	+	99.8	+	+

* In this table the following abbreviations are employed: S, spinal; En., encephalic; L.B. light brown; D, dark; Pa., paresis; G, good; P, poor. † Cousins but not living in same house.

series, and for some time we regarded that one as a doubtful case. It would be interesting to know whether poliomyelitis shows some special predilection for those of fair complexion or whether this was a mere incident in our series. Its prevalence in Sweden and Norway would further make us think that the fair haired may show some special predisposition.

As our patients were brought to the hospital by the department of health ambulances without an accompanying relative, it was very difficult and often impossible to gain any history of the onset other than the date. Consequently we were unable to obtain in practically all instances even a theoretical source of infection. We have been indirectly informed, however, that in nearly all cases there was some history of injury. In some of the latter instances it was evident that the injury, usually a fall, occurred at the time of onset of the paralysis. In a series of 150 cases, Lovett[5] Again referring to Table 1, it will be noted that there were known to be thirty-six children of various ages who were closely associated with the patients in the acute stage, and yet thus far there have been no two cases in any one family. However, there was one instance of two cousins being admitted to the hospital. Nevertheless they did not live in the same house, nor were their residences nearby. In fact, they had not seen one another "for more than a month" previous to their illness. Furthermore, while we have a definite record of only thirty-six contacts among children, there were probably at least double that number, including all ages of all the families. In this connection, it may be said, Wickman believes that abortive cases are commonly overlooked as carriers.

Our routine hospital treatment consists of a warm bath on admission, cleansing eyes and nose with a 20 per cent. argyrol solution, and putting the patient to

5. Lovett: Infantile Paralysis in Massachusetts in 1909, Month. Bull. Massachusetts State Board of Health, June, 1910.

6. Frost, Wade H.: Epidemiologic Studies of Acute Anterior Poliomyelitis, Bull. 90, Hyg. Lab., U. S. P. H. S., October, 1913, p. 14.

bed. A nose and throat culture is also made at this time. Heavy stockings are put on and every endeavor made to keep the limbs warm. The patient is dressed comfortably, and in most cases bedclothing over the patient is not only unnecessary but undesirable. If used, supports should be provided, so that it does not weigh on the toes.

TABLE 2.—RESULTS OF SPINAL PUNCTURES

Case Number	Pressure*	Clear	Nonne	Fehling's	Cell Count
1	N	+	—	—	20
2	N	+	—	—	10
3	N	+	+	+	20
4	N	T	+	—	12
5	N	+	—	+	16
6	N	+	+	—	12
7	S	+	++	—	98
8	N	+	+	—	14
9	N	+	—	—	8
10	S	+	—	—	6
11	N	+	+	+	36
12	N	+	+	+	46
13	N	+	++	+	67
14	N	+	—	—	36
15	..	..	..	..	..
16	N	+	—	—	14
17	S	+	+	+	28
18	N	+	+	—	3
19	N	+	—	—	12
20	..	..	..	..	..
21	N	+	+	+	8
22	..	..	..	..	..
23	S	+	+	+	15
24	N	+	—	—	4
25	N	+	+	—	30
26	+	+	+	++	18
27	+	+	+	++	14
28	N	+	+	+	12
29	N	+	—	+	23
30	N	+	—	—	15

* Spinal fluid key: N, normal; +, increased; S, very slight increase; T, turbid.

A laxative, usually some form of cascara, is given on admission, and in addition an enema on either the same day or the following morning. A light diet is provided for children old enough to partake of it. In the case of nursing babies, accommodations for the mothers are arranged for in the hospital. Hexamethylenamin was given the first few patients, but was soon discarded, as there is pretty conclusive proof that it is of no benefit after the disease has begun.[7]

Table 2 shows the results of the spinal punctures. In Cases 15, 20 and 22, so much difficulty was encountered that all further efforts to tap the spinal canal were abandoned. As may be seen, we found very few of these cases with an increased pressure. This, however, may be explained on the ground that most of these patients had passed the early acute stage. The amount of fluid varied from 3 to 10 c.c., and was obtained in almost each instance on the same day the white count was made. The cell count per cubic centimeter of fluid was also seen to be low in most instances.

Where the patient was received early, following lumbar puncture, from 0.5 to 1 c.c. of 1:1,000 epinephrin chlorid solution was given intraspinally, following the suggestion of Meltzer.[8] This was repeated every four to six hours, provided the pulse rate did not exceed 160. In no case, however, did we repeat the dose more than three times.

Some patients showed marked improvement in from one-half to one hour following the epinephrin injection. On several occasions a patient with a totally paralyzed arm would make a voluntary movement of the arm within an hour after receiving the epinephrin. Such marked improvement, however, was seldom permanent, but gradual improvement in some cases seemed to be more rapid. Lucas and Osgood[9] have shown that little can be expected of vaccines. However, the benefits to be derived from the intraspinal use of horse serum[10] seem promising. At the date of writing, we had not made use of the latter method of treatment.

We made no use of electricity, and did not institute massage until all acute symptoms had subsided. We believe that rest and quiet are the two chief requirements of the patient in the acute stage. Ordinarily massage was begun in from two to three weeks from the onset of the disease, according to the severity of the case. The patients are kept in bed throughout their stay in the hospital, and on discharge instructions given the parents regarding the necessity for further treatment. Among our cases there were but three which showed a tendency to impending deformity through the contraction of muscles. Nevertheless, it was too early to expect that which may develop, if proper precautions are not taken, in the months to come. Where foot drop is marked, plaster casts should be applied to overcorrect this slightly. The cast should later be cut so that it will be removable in order that massage may be applied.

Both Ed Müller and Paul Krause[11] state that a leukopenia is present in acute poliomyelitis. The latter remarks that "a marked leukopenia is characteristic of anterior poliomyelitis." The blood findings in the cases presented by us do not confirm the foregoing assertion.

TABLE 3.—LEUKOCYTE COUNTS

Case Number	White Count	Day of Disease
1	11,500	30
2	11,750	5
3	18,000	14
4	11,200	21
5	7,850	16
6	13,600	21
7	10,000	13
8	7,500	10 (?)
9	8,000	11
10	12,700	12
11	11,800	13
12	6,700	7 (?)
13	14,200	13
14	8,000	12
15	16,300	11
16	15,800	10
17	19,600	22
18	11,400	5
19	13,250	5
20	15,500	7 (?)
21	9,800	7 (?)
22	12,600	16
23	13,350	15
24	11,000	8
25	11,000	8
26	14,800	4
27	20,800	7 (?)
28	14,600	7 (?)
29	23,600	3
30	14,300	7

In Table 3 it will be seen that a leukocytosis was almost constant, and that it usually persisted for at least two weeks, and frequently much longer. It would seem that the white count should serve as a good index in determining the time to begin active manipulations of the muscles.

7. Kelly, E. R.; Gellhorn, W., and Manning, J. B.: Report of Infantile Paralysis in State of Washington during 1910, Olympia, Washington, 1911, p. 18. Römer, Paul H.: Epidemic Infantile Paralysis, translated by H. Ridley Prentice, New York, William Wood & Co., 1913, p. 174.

8. Meltzer, S. J.: Symposium on Infantile Paralysis, abstr., THE JOURNAL A. M. A., July 22, 1916, p. 314.

9. Lucas and Osgood, quoted by Kelly (Footnote 7), p. 145.

10. Sophian, Abraham: Specific Treatment of Infantile Paralysis, THE JOURNAL A. M. A., Aug. 5, 1916, p. 427.

11. Krause, Paul: Lehrbuch der klinischen Diagnostik innerer Krankheiten, 1913, p. 87.

During the period of quarantine or hospitalization, all discharges, including bowel movements, must be disinfected. Every effort must also be made to see that the surroundings are free from flies or insects of any nature. In view of a certain amount of uncertainty in the matter, it is well to be on the lookout for the bedbug as a possible carrier, since Frauenthal[12] affirms that bedbugs have transmitted the disease, and Flexner has shown an instance of this in monkeys.

There is at least one other perplexing question in connection with this disease which should be mentioned. For how long a time should a case of acute poliomyelitis be quarantined? A few years ago the Paris Academy of Medicine[13] recommended the isolation of convalescents and patients for three months. Sawyer,[14] however, showed that while virus was present in the rectal washings sixteen days after the onset of the acute attack, it was nevertheless absent in both nasal and rectal washings thirty-seven days after the onset of the disease. Ed Müller believes that the period of isolation should be eight weeks, while in Sweden it is usually three weeks. The latter is also said to be the length of quarantine in Pennsylvania. In accordance with the regulations of the Illinois State Board of Health, the minimum period of quarantine in Chicago is five weeks.

It is interesting to note that in our small series of cases there were no deaths, whereas the mortality among the New York cases is high, apparently exceeding 20 per cent. Statistics show the average mortality to be 10.31 per cent.; that it is lowest at 5 years and highest at from 21 to 30 years. In this connection it is well to remember that while the great majority of acute poliomyelitis cases occur before the age of 5 years, recent statistics tend to indicate that the number of cases over 5 years is gradually increasing. It must also be borne in mind that no age may be said to be exempt.

Notwithstanding the dire results which so frequently follow an attack of poliomyelitis, the percentage of complete recoveries is often high. Statistics show a variation in this respect all the way from 15 to 50 per cent.

CONCLUSIONS

1. There is still some unknown agency responsible for the transmission of poliomyelitis. Not every case is acquired through direct contact or by means of a human carrier.

2. A leukopenia is not characteristic of poliomyelitis, since a leukocytosis was present in almost every case observed by us.

3. In order to control an epidemic or an impending epidemic, isolation by means of compulsory hospitalization will give the best results.

4. An isolation period of three weeks from the date of attack is probably sufficient.

25 East Washington Street.

12. Frauenthal, H. W., and Manning, J. V.: Infantile Paralysis and Modern Methods of Treatment, Philadelphia, F. A. Davis Company, 1914, p. 63.
13. Forchheimer: Therapeusis of Internal Diseases, iv, 237, New York, D. Appleton & Co., 1914.
14. Sawyer, W. A.: An Epidemiological Study of Poliomyelitis, Am. Jour. Trop. Dis. and Prev. Med., September, 1915, p. 164.

Public Nutrition.—The nutrition of the great mass of the people is a question of the highest importance, deserving far more attention than it has hitherto received. All the great countries ought to have a central authority, which should concern itself exclusively with the far-reaching questions of the well-being of the people.—Rubner.

MUNICIPAL CONTROL OF INFANTILE PARALYSIS

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Municipal control of epidemics of infantile paralysis is a most difficult problem. In order to obtain any results we must utilize our knowledge to the utmost; measures should be comprehensive, definite and rigid.

Infantile paralysis is produced by a minute infectious agent which cannot be isolated, cultivated or identified by the usual bacteriologic method. The virus is present in the secretions of the nose, throat and intestines of the sick, and has been found in the noses and throats of healthy contacts, who may remain healthy carriers.

The virus can be carried on the surface and in the intestines of the common house fly. It is probable that other insects, vermin and domestic animals may similarly carry and disseminate the virus.

Accurate data have not been obtained on the duration of living virus in the nose and throat of the sick or in healthy contacts. In monkeys the virus has been found in the mucous membrane of the nose and throat as long as six months after the occurrence of paralysis. It is very probable that carriers of this disease, as in meningococcic meningitis, group themselves into the larger group of temporary transient carriers, and a smaller group of permanent carriers or carriers over a long period of time.

The virus has been found in the dust of rooms containing patients with infantile paralysis. It is unusually resistant to drying, summer temperatures and the action of 0.5 per cent. phenol (carbolic acid) and glycerin.

The virus may therefore be disseminated by the sick, by healthy carriers, by the fly, insects or other animal carriers, and through the agency of dust, dirt, food, garbage or refuse which has become accidentally contaminated with the virus. This can readily occur through the coughing, sneezing, or promiscuous spitting of carriers.

Studies of the present and previous epidemics indicate that the disease is transmitted along the route of human travel and intercourse; that the disease is transmitted principally through the agency of healthy carriers.

EPIDEMIOLOGY

Two factors are necessary for the occurrence of infectious disease: a highly virulent infectious agent and a susceptible individual. Infantile paralysis is always sporadic in this country. It has been suggested that the virus fluctuates in virulence and may suddenly assume excessively virulent properties. For an epidemic of any disease to occur, there must be general lowered resistance to the disease. In time of epidemic, on account of general exposure, it is probable that a widespread and high immunity develops. In periods free from epidemic, this immunity probably gradually dies out.

The introduction of a highly virulent virus during a period of general lowered resistance can explain epidemics, recurring in cyclic manner.

General and widespread nasopharyngeal catarrh would offer a ready means of widespread production

of carriers and dissemination of an infectious agent. The past winter in this country was unusually severe, and epidemics of grip were general and alarming; few persons escaped a few days' disability from nasopharyngeal catarrh.

It is obvious that infantile paralysis is a highly contagious disease, with an infectious agent easily disseminated. Unlike the other contagious diseases, as scarlet fever, measles and diphtheria, easily controlled by suitable quarantine, this disease is extremely difficult to control. Few who are exposed actually develop the disease. This epidemic teaches that sporadic cases at all times should have the most rigid quarantine of the sick and the healthy contacts.

With the outbreak of a large, apparently uncontrollable epidemic of infantile paralysis in New York City, there was ample cause for alarm in neighboring cities in close business relationship with New York. The immediate outbreak of cases in these cities, and large epidemics in some, indicated that the most rigorous methods would have to be immediately employed to prevent epidemics in these cities. An especially serious problem was the flocking of thousands of children from New York to the surrounding country.

PREVENTIVE MEASURES

The preventive campaign as planned and rigidly carried out in Bridgeport may be classified as follows:

1. Quarantine of the sick and healthy contacts.
2. Exclusion of probable carriers from New York and adjoining cities in which the disease was epidemic.
3. Establishment of a special central hospital to which was enforced compulsory removal of all patients with infantile paralysis.
4. Organization of a special medical "poliomyelitis diagnosis squad."
5. Repeated circularization of the physicians, calling attention to abortive cases and the preparalytic stage of the disease.
6. Mobilization and enlargement of all the sanitary forces covering the street cleaning department, garbage department, police and fire departments, regular sanitary inspectors, and the staff of nurses.

1. *Quarantine.*—Quarantine of the sick should be rigid, and, until we learn more about the disease, should cover the probable period of the epidemic, about eight weeks. Rigid quarantine means removal of the patients from their homes except in special but rare instances in which quarantine can be carried out at home. All patients were kept at the poliomyelitis hospital for a period of eight weeks.

Families in which the disease occurred were quarantined for ten days. In every instance an officer was stationed at the outside door during the entire period of the quarantine. Each house was fumigated as soon as the patient was removed. A quarantine officer visited the premises twice daily, watched the other children, and issued circulars and personal instructions as to renovation and cleaning up of the houses. All were advised to use a spray of salt solution and also 1 per cent. peroxid several times daily for the nose and throat.

When cases occurred in tenement houses, all the children in the tenement were quarantined, but the wage earners in the family outside of the first quarantine were allowed to come and go. Special intensive efforts of thorough sanitation and inspection were used for the quarantined tenement houses and those near by. The streets were carefully cleaned, flushed or oiled. Instructions were issued to avoid raising dust in sweeping houses, sidewalks or streets. Accumulation of garbage was avoided.

Quarantined houses were placarded, as was the street in which the quarantined houses were situated.

2. *Exclusion of Probable Carriers.*—The disease is transmitted along the course of human travel and intercourse. Children are principally affected. The number of healthy carriers are probably far in excess of the sick. There is no practical way of determining these carriers. The safe way was to exclude all children under 10 from Bridgeport who came from cities in which this disease was actively epidemic. There are so many indirect ways of contact that it is certainly an unsafe procedure to depend on a health certificate issued by a private physician or a health department, since neither could be at all familiar in most cases with the daily life of the applicant. We found that a number of those wishing to come to the city of Bridgeport gave untrue stories of their previous address and destination. A number of automobile parties were caught coming in during the very early hours of the morning on unfrequented highways. These evasions occurred in most instances among those who had no particular business in Bridgeport.

All railroads, boats and roads were carefully patrolled.

3. *Establishment of a Special Poliomyelitis Hospital.*—It was deemed wise to remove all patients from their homes. A specially organized trained medical staff as well as hospital was provided for the care of the patients. As a general rule there was little objection to the removal of patients from their homes, when the parents learned that special attention and care had been provided for their children.

4. *Organization of Poliomyelitis Diagnostic Squad.*—Early diagnosis and diagnosis of abortive cases are most important. The medical society was asked to appoint a diagnostic committee especially fitted for the work. Immediately on the report of cases to the health department, a member of the diagnostic committee was notified and immediately visited the patient. Many cases were diagnosed early in this way, and abortive cases were caught which otherwise might have been overlooked for a time at least.

6. *Mobilization of Sanitary Forces.*—A cooperative mobilization of all the sanitary forces was secured. This enabled a thorough intensive cleaning up of the city, of the streets, the homes, the people, places of amusement, restaurants, hotels and boarding houses.

A campaign of education of the public was instituted through the press, from the pulpit, on the screen, by circularization, and by talks from civic bodies. A house to house canvass was made in which parents were instructed in the principles of hygiene and sanitation.

Especial attention was given to prevent the collection of children anywhere in crowds. By health department order they were excluded from Sunday school, public play grounds, theaters, stores, picnics, circuses, from street cars at certain times of the day, and from boats. The children's department of the public library was closed, public band concerts were discontinued, and public dumps were carefully patrolled. Soda fountains were rigidly checked up.

A fly swatting campaign was instituted and the anti-spitting law (including the streets) was rigidly enforced.

CONCLUSION

Every force, medical, sanitary and civic, must be mobilized to meet this disease.

Are preventive measures of material help? It is of course impossible except by comparison to judge the number of cases that might have occurred had not active measures been instituted. The relatively larger number of cases in other cities indicates so far that active measures are important.

GASTRO-INTESTINAL FINDINGS IN ACNE VULGARIS

ESPECIALLY FLUOROSCOPIC *

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It is generally recognized that the acne bacillus is the direct cause of acne vulgaris; yet there are a number of associated conditions which the patients often show that are regarded as predisposing factors. Among these may be mentioned puberty, anemia, and utero-ovarian and gastro-intestinal disorders. Varying degrees of emphasis have been placed on these factors in their relation to acne by different authors and investigators. Probably those which have received the most attention are the gastro-intestinal affections; but the observations have been mostly of a clinical nature.

One of the earliest investigators in this line was Barthelemey,[1] who, in 169 cases of acne, found clapotage in all but four cases. According to this author acne does not exist without dilatation of the stomach.

Mitour[2] examined thirteen patients with acne, seven of whom had dyspepsia, and the gastric contents showed an increase in the acids of fermentation. He defined the dyspepsia which is present in acne as that type which is characterized by distention and fermentation of the stomach accompanied by considerable variation in the gastric hydrochloric acid content.

Bach[3] examined 128 cases of acne in women for hemoglobin content of the blood, female disorders, and gastro-intestinal derangements. Only the gastro-intestinal disorders showed a higher percentage in the acne patients than in the control of cases, of which there were sixty-two.

White[4] found digestive disturbances in 59 per cent. of 438 cases of skin diseases. The percentage, however, in the acne cases alone was only 55, which was somewhat lower than the general average.

Other lines of investigation, as those of Kapp,[5] who found in thirty-three cases of acne the presence of indol in the urines of all the patients, have suggested that there is a toxic protein decomposition in many cases of acne which is most likely dependent on intestinal stasis.

At the suggestion of Dr. Gilchrist, we thought that more definite information might be obtained as to the nature of the gastro-intestinal disorders accompanying acne, by fluoroscopy of the gastro-intestinal tracts of acne patients. This method of investigation, which as far as we know has not been carried out before in this disease, would be of especial value in determining if an anatomic basis existed in these patients which would permit protein decomposition and toxic absorption. Besides the fluoroscopy of the gastro-intestinal tracts, the patients also received test meals, and analysis of the gastric contents was made.

METHOD

1. *Gastric Analysis.*—(*a*) Fasting Stomach: Patients were given 6 tablespoonfuls of boiled rice at 9:30 p. m. Nothing was taken by mouth after this. The contents of the stomach were removed at 9 o'clock on the following morning and examined for amount, presence of free hydrochloric acid and occurrence of rice retention as evidenced by Hausmann's test and microscopic examination after staining for starch with iodin.

(*b*) Test Breakfast: After removal of the contents of the fasting stomach the patients were given two small slices of bread and about 250 c.c. of water. This was removed one hour later. The total and free acidity were titrated and expressed in cubic centimeters of tenth normal sodium hydroxid per hundred c.c. of the gastric fluid removed.

2. *Fluoroscopic Examination.*— Patients were given 1 ounce of bismuth subcarbonate in a glass of water at 5 p. m. on the day prior to examination. Eighteen hours later a second dose of the same amount was given just before the patients were examined by the fluoroscope. All the patients were examined in the upright position.

DEFINITIONS

1. Normal gastric acidity: Total acidity, from 40 to 60; free acidity, from 20 to 40.

2. Retention: The presence of rice granules in the contents of the fasting stomach denotes retention. When distinguishable to the naked eye, as shown by Hausmann's test, it denotes a greater degree of retention than when only apparent after microscopic examination.

3. Secretion: Any amount of fluid above 25 c.c. obtained from the fasting stomach was considered abnormal.

4. Position of the stomach: Ptosis was considered to be present only when the lower level of the stomach was below the level of the crest of the ilium.

5. Position of the colon: Ptosis of the colon was considered to be present when it lay below the level of the crest of the ilium. When the transverse colon lay on the floor of the pelvis, the maximum grade of ptosis was considered to be present.

All of the material was taken from the skin clinic and was not selected. The following thirty cases were examined in the gastro-intestinal department under the supervision of Dr. Brown:

CASE RECORDS

CASE 1.—Boy, aged 15. Acne medium, duration six months. Has had pain in stomach for the past two or three years after meals. Constipated. (1) Gastric examination: Fasting stomach; 25 c.c.; free hydrochloric acid present; Hausmann's test negative. Microscopic examination: Starch negative.

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* From the dermatologic and gastro-intestinal departments of the Johns Hopkins University.
* Read before the Section on Dermatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Barthelemey: Arch. gén. de méd., 1889.
2. Mitour: Étude sur la nature et le traitement de la dyspepsie accompagnée d'acné, Thèse de Paris, 1896.
3. Bach: Klin.-therap. Wchnschr., 1907, Nos. 35, 36, 37.
4. White: Boston Med. and Surg. Jour., 1907, vii, 225.
5. Kapp: Therap. Monatsh., 1907.

Test breakfast; 70 c.c.; free hydrochloric acid, 10; total acid, 41. (2) Roentgen examination: Stomach large and atonic. Cecal stasis and prolapse of the transverse colon.

Summary.—Hypochlorhydria. Ptosis and atony of the stomach. Ptosis of the colon. Cecal stasis.

CASE 2.—Girl, aged 17. Acne mild, duration six months. No history of gastric disturbances. Bowels regular. (1) Gastric examination: Fasting stomach; 40 c.c.; free hydrochloric acid present, Hausmann's test negative. Microscopic examination: Starch negative. Test breakfast; 130 c.c.; free hydrocloric acid, 36; total acid, 56. (2) Roentgen examination: Stomach in good position, slightly atonic. Intestines normal.

Summary.—Practically normal findings (except slight gastric atony).

CASE 3.—Negro woman, aged 30. Acne medium, duration five or six years. Patient often has a tight feeling in the stomach and belches sour food after meals. Bowels constipated. (1) Gastric examination: Fasting stomach; 20 c.c.; Hausmann's test positive. Microscopic examination: Starch positive. Free hydrochloric acid present. Test breakfast; 80 c.c.; free hydrochloric acid 27; total acid, 44. (2) Roentgen examination: Stomach high. Slight prepyloric bulging. Motor function normal. Prolapse of the hepatic flexure. On deep inspiration prepyloric region pulled out, suggesting loose lower right quadrant adhesions.

Summary.—Spastic pylorus with slight retention, due to a reflex spasm from right lower quadrant adhesions. Prolapse of hepatic flexure.

CASE 4.—Girl, aged 20. Acne medium, duration six years. Paticnt often belches sour food after meals. Bowels constipated. (1) Gastric examination: Fasting stomach; 55 c.c.; free hydrochloric acid present; Hausmann's test negative. Microscopic examination: Starch negative. Test breakfast; 20 c.c.; free hydrochloric acid, 4; total acid, 24. (2) Roentgen examination: Stomach dilated, three fingers' breadths below crest of the ilium. Congenitally fixed duodenum. Sluggish peristalsis.

Summary.—Gastric atony and stasis. Hypochlorhydria.

CASE 5.—Girl, aged 18. Acne medium, duration two years. Often has hiccups and a sour taste after meals. Bowels regular. (1) Gastric examination: Fasting stomach; 45 c.c.; free hydrochloric acid presept; Hausmann's test negative. Microscopic examination: Starch negative. Test breakfast; 77 c.c.; free hydrochloric acid, 40; total acid, 72. (2) Roentgen examination: Stomach just below crest of ilium. Normal size. Hyperperistalsis and motility. Prepyloric bulging. Moderate prolapse of hepatic flexure which is pulled over to pyloric region, then drops down to the left iliac fossa, thence irregularly up to the splenic flexure, which is in good position.

Summary.—Hyperacidity and slight hypersecretion. Hyperperistalsis and motility. Suggests irritative lesion in the pyloric region, possibly duodenal ulcer. Pelvic adhesions.

CASE 6.—Boy, aged 15 years. Acne mild, duration two months. No gastric symptoms. Bowels regular. (1) Gastric examination: Fasting stomach; 84 c.c.; free hydrochloric acid present; Hausmann's test positive. Microscopic examination: Starch positive. Test breakfast; 100 c.c.; free hydrochloric acid, 23; total acid, 37. (2) Roentgen examination: Stomach very large, three fingers' breadths below crest of ilium. Markedly increased peristalsis; bismuth going over rapidly into duodenum. Some prepyloric bulging. Prolapse of the transverse colon.

Summary.—Irritative lesion in pyloric region with gastric retention and ptosis of transverse colon.

CASE 7.—Boy, aged 19. Acne medium, duration one year. For the past three months has had colicky pains in the stomach with no reference to meals. Has been constipated for the last three months. (1) Gastric examination: Fasting stomach; 16 c.c.; free hydrochloric acid present; Hausmann's test negative. Microscopic examination: Starch negative. Test breakfast; 23 c.c.; free hydrochloric acid, 29; total acid, 60. (Stool shows occult blood.) (2) Roentgen examination: Stomach, fair position; hyperperistalsis; hypermotility. Large intestine in good position.

Summary.—Hyperactive stomach. Irritative lesion in region of duodenum, probably ulcer.

CASE 8.—Woman, aged 21 years. Acne severe, duration three years. Patient complains of full feeling in stomach after meals and is constipated. (1) Gastric examination: Fasting stomach; 5 c.c.; free hydrochloric acid present; Hausmann's test negative. Microscopic examination: Starch negative. Test breakfast; 17 c.c.; free hydrochloric acid, 20; total acid, 44. (2) Roentgen examination: Stomach, fish-hook type, three fingers' breadths below crest of ilium. Normal peristalsis, hypermotility; cecal stasis. Hepatic flexure and ascending colon kinked back on cecum; prolapse of the transverse colon.

Summary.—Prolapse of the stomach and colon. Right lower quadrant adhesions. Hyperchlorhydria. Fecal stasis. Condition suggests chronic appendix with hyperactive stomach.

CASE 9.—Boy, aged 16. Acne severe, duration one year. No gastric symptoms except belching of sour food occasionally after meals. Bowels regular. (1) Gastric examination: Fasting stomach; 10 c.c.; free hydrochloric acid present; Hausmann's test negative. Microscopic examination: Starch negative. Test breakfast; 58 c.c.; free hydrochloric acid, 12; total acid, 35. (2) Roentgen examination: Stomach practically in normal position, slightly on the right side. No cecal stasis. Segmentation of the transverse colon. Bismuth mostly in the rectum.

Summary.—Intestinal picture of mucous colitis; hypoacidity.

CASE 10.—Girl, aged 19. Acne mild, duration five years. No gastric symptoms; bowels regular. (1) Gastric examination: Fasting stomach; 22 c.c.; free hydrochloric acid present; Hausmann's test negative. Microscopic examination: A few starch granules present. Test breakfast; 25 c.c.; free hydrochloric acid, 37; total acid, 51. (2) Roentgen examination: Stomach normal in size and position; no cecal stasis, marked ptosis of the transverse colon, which reaches to the bottom of the pelvis. Marked redundancy and atony of the transverse colon.

Summary.—Marked ptosis of transverse colon; fecal stasis.

CASE 11.—Woman, aged 23. Acne severe, duration one year. No symptoms referable to gastro-intestinal tract; bowels regular. (1) Gastric examination: Fasting stomach, 45 c.c.; free hydrochloric acid present; Hausmann's test negative. Microscopic examination: Starch negative. Test breakfast; 135 c.c.; free acid, 18; total acid, 43. (2) Roentgen examination: Stomach ptosed nearly to bottom of pelvis, atonic with sluggish peristalsis. Cecal stasis.

Summary.—Ptosis and atony of stomach; hypersecretion; hyperchlorhydria; fecal stasis.

CASE 12.—Boy, aged 18. Acne medium, duration one year, No gastro-intestinal symptoms. Bowels regular. (1) Gastric examination: Fasting stomach empty. Test breakfast; free hydrochloric acid, 14; total acid, 24. (2) Roentgen examination: Stomach large, atonic, at level of crest of the ilium; poor peristalsis and motility; stomach pulled somewhat down into the lower right quadrant; moderate cecal stasis; prolapsed spastic transverse colon.

Summary.—Right lower quadrant adhesions; fecal stasis; atony of the stomach and hyperchlorhydria; probably a chronic appendicitis.

CASE 13.—Man, aged 21. Acne medium, duration five years. No gastro-intestinal symptoms; bowels constipated. (1) Gastric examination: Fasting stomach; 10 c.c.; free hydrochloric acid present; Hausmann's test negative. Microscopic examination: Starch positive. Test breakfast; 80 c.c.; free hydrochloric acid, 28; total acid, 31. (2) Roentgen examination: Stomach two fingers' breadths below the crest of the ilium. Good peristalsis and motility. No cecal stasis; most of the bismuth in descending colon and rectum.

Summary.—Practically normal finding with slight gastroptosis.

CASE 14.—Boy, aged 15. Acne medium, duration two years. Patient often has fulness of stomach and shortness of breath after eating fried food. Bowels regular. (1) Gastric examination: Fasting stomach; 12 c.c.; free hydrochloric acid negative; Hausmann's test negative. Microscopic examination: Starch positive. Test breakfast; 20 c.c.; free hydro-

chloric acid, 4; total acid, 8. (2) Roentgen examination: Stomach to level of crest of ilium; normal size, good tone. Pylorus pulled down to right lower quadrant; cecal stasis. Ascending and first part of transverse colon kinked back on cecum. Pyloric and cecal regions move *en masse*. Ptosis of transverse colon.

Summary.—Right lower quadrant adhesions; fecal stasis; marked subacidity; suggests chronic appendicitis.

CASE 15.—Boy, aged 19. Acne medium, duration three years. Occasionally spits up sour food after meals. Bowels regular. (1) Gastric examination: Fasting stomach; 10 c.c.; Hausmann's test negative. Microscopic examination: Starch positive. Free hydrochloric acid present. Test breakfast; free acid, 5; total acid, 17. (2) Roentgen examination: Stomach good position; vertical type; reaches to the crest of the ilium; good peristalsis and motility. Vertical duodenal cap; definite cecal stasis; ptosis of hepatic flexure with kinking back of ascending and transverse colon on cecum; fixation of cecum. Spastic transverse colon.

Summary.—Subacidity marked; fecal stasis and spastic transverse colon.

CASE 16.—Boy, aged 13. Acne medium, duration one and one-half years. Patient often spits up sour food after meals. Bowels regular. (1) Gastric examination: Fasting stomach; 10 c.c.; free hydrochloric acid present; Hausmann's test negative. Microscopic examination: A few starch granules present. Test breakfast; 25 c.c.; free hydrochloric acid, 22; total acid, 36. (2) Roentgen examination: Stomach three fingers' breadths above the crest of the ilium, normal size, slightly atonic; cecal stasis; pylorus pulled down and to the right. No evidence of definite adhesions in cecal region. Large amount of bismuth in cecal region.

Summary.—Slight subacidity; fecal stasis.

CASE 17.—Boy, aged 14. Acne mild, duration six months. No gastric symptoms; bowels regular. (1) Gastric examination: Fasting stomach; 10 c.c.; free hydrochloric acid present; Hausmann's test positive. Microscopic examination: starch positive. Test breakfast: 40 c.c.; free acid, 35; total acid, 52. (2) Roentgen examination: Stomach normal sized, pylorus drawn down into right lower quadrant; increased peristalsis, cecal stasis, ascending colon kinked back on cecum. Transverse colon in good position.

Summary.—Right lower quadrant adhesions with hyperactive stomach suggesting chronic appendicitis; fecal stasis.

CASE 18.—Man, aged 21. Acne medium, duration three years. Patient often belches up sour food after meals and occasionally after eating meats he has pains in the right side. Bowels regular. (This patient also has a vesicular eczema on hands, of three weeks' duration.) (1) Gastric examination: Fasting stomach; 25 c.c.; free hydrochloric acid present; Hausmann's test positive. Microscopic examination: Starch positive. Test breakfast: 110 c.c.; free hydrochloric acid, 34; total acid, 51. Roentgen examination: Hypermotility and hyperperistalsis of stomach; pylorus pulled over to right and downward; moderate cecal stasis. Hepatic flexure pulled over to prepyloric region, then back on cecum and up to splenic flexure.

Summary.—Right lower quadrant adhesions suggesting chronic appendicitis; hypermotility of stomach, moderate fecal stasis.

CASE 19.—Girl, aged 15. Acne mild, duration two years. Patient occasionally spits up sour food after meals, and has a feeling of fulness in epigastrium. (1) Gastric examination: Fasting stomach; 15 c.c.; free hydrochloric acid present; Hausmann's test and microscopic starch negative. Test breakfast: 90 c.c.; free hydrochloric acid, 24; total acid, 51. (2) Roentgen examination: Stomach normal sized, with marked increase in peristalsis; pylorus pulled down to right lower quadrant.

Summary.—Chronic appendicitis.

CASE 20.—Woman, aged 21. Acne mild, duration eight years. Patient occasionally has "heart burn" and a feeling of fulness after meals. Bowels constipated unless she takes medicine regularly. (1) Gastric examination: Fasting stomach; 35 c.c.; free hydrochloric acid present; Hausmann's test and microscopic starch negative. Test breakfast: 75 c.c.; free hydrochloric acid, 25; total acid, 40. (2) Roentgen examination: Stomach normal in size; in good position with slight tendency to hour glass type. At junction of middle and upper third there is a slight prepyloric bulging. Vertical duodenal cap present. Moderate cecal stasis. Ascending colon kinked back on cecum and drawn down to prepyloric region. Colon in good position.

Summary.—Pericecal adhesions with reflex spastic stomach; fecal stasis; suggests a high chronic appendicitis with probable pylorospasm.

CASE 21.—Woman, aged 21. Acne mild, duration two years. Patient often has "heart burn" and belches sour food after meals. Bowels constipated. (1) Gastric examination: Fasting stomach; 5 c.c.; free hydrochloric acid present; Hausmann's test and microscopic starch negative. Test breakfast: 50 c.c.; free hydrochloric acid, 30; total acid, 17. (2) Roentgen examination: Stomach normal size, reaching just to crest; vertical fishhook type. Orthotonic; good peristalsis and motility. No cecal stasis. Most of bismuth in sigmoid and rectum. Very slight ptosis.

Summary.—Subacidity; slight ptosis.

CASE 22.—Boy, aged 18. Acne severe, duration three years. No gastric symptoms. Bowels regular. (1) Gastric examination: Fasting stomach; 25 c.c.; free hydrochloric acid present; Hausmann's test and microscopic starch negative. Test breakfast: 125 c.c.; free hydrochloric acid, 42; total acid, 62. (2) Roentgen examination: Stomach to level of crest; vertical fishhook type; slightly atonic; sluggish peristalsis and motility. Pylorus ptosed. Cecal stasis. (Rest of picture not made out, as patient's bowels had moved.)

Summary.—Gastroptosis with atony; fecal stasis; slight hyperacidity.

CASE 23.—Girl, aged 20. Acne severe, duration five years. Has had indigestion for a number of years. Has feeling of fulness and belches food after meals. Bowels constipated. (1) Gastric examination: Fasting stomach; 40 c.c.; free hydrochloric acid present; Hausmann's test and microscopic starch negative. Test breakfast: free hydrochloric acid, 6; total acid, 18. (2) Roentgen examination: Stomach dilated, atonic and ptosed a hand's breadth below crest of ilium. Marked prolapse of the transverse colon. Considerable bismuth in rectum.

Summary.—Splanchnoptosis, with atony of stomach and marked subacidity; fecal stasis.

CASE 24.—Boy, aged 18. Acne medium, duration two years. No gastro-intestinal symptoms. Bowels move daily. (1) Gastric examination: Fasting stomach: 20 c.c.; free hydrochloric acid present; Hausmann's test and microscopic starch negative. Test breakfast: 10 c.c.; free hydrochloric acid, 29; total acid, 40. (2) Roentgen examination: Stomach normal size, reaching to crest, vertical type; lateral duodenal cap. Increased peristalsis and motility. Moderate cecal stasis and ptosis of transverse colon. Bismuth seen going over in large quantities into duodenum.

Summary.—Hypermotility of stomach; ptosis of transverse colon; fecal stasis; possible irritative duodenal lesion.

CASE 25.—Girl, aged 25. Acne mild, duration three years. Patient often has a sour stomach and belches after meals. Bowels constipated. (1) Gastric examination: Fasting stomach (lost). Test breakfast: 90 c.c.; free hydrochloric acid, 26; total acid, 60. (2) Roentgen examination: Baglike, atonic stomach. Ptosis of stomach and intestines. Kinking of the ascending colon and hepatic flexure.

Summary.—Ptosis and atony of stomach and intestines; fecal stasis.

CASE 26.—Girl, aged 20. Acne medium, duration one year. No gastro-intestinal symptoms. Bowels regular. (1) Gastric examination: Fasting stomach: 20 c.c.; free hydrochloric acid present; Hausmann's test and microscopic starch positive. Test breakfast: 110 c.c.; free hydrochloric acid, 13; total acid, 41. (2) Roentgen examination: Stomach in good position. Cecal stasis. Hepatic flexure bent back on cecum forming an angle. Prolapse of the transverse colon.

Summary.—Prolapse of transverse colon; cecal stasis; subacidity.

Case 27.—Girl, aged 18. Acne mild, duration five months. Patient occasionally belches sour food and has cramps in stomach after meals. (1) Gastric examination: Fasting stomach: free hydrochloric acid present; Hausmann's test and microscopic starch positive. Test breakfast (refused). (2) Roentgen examination: Atonic ptosed stomach, three fingers' breadths below the crest of the ilium on left side. Cecal stasis and ptosis of the large intestine.

Summary.—Ptosis and atony of stomach and colon; gastric retention; fecal stasis.

Case 28.—Girl, aged 19. Acne medium, duration two months. No gastro-intestinal symptoms. Bowels regular. (1) Gastric examination (refused). (2) Roentgen examination: Stomach slightly ptosed and atonic. Transverse colon kinked back and adherent to the cecum. Hepatic flexure prolapsed. Cecal stasis. Pylorus drawn slightly down into the right lower quadrant. Cecal and prepyloric region move *en masse*.

Summary.—Ptosis and atony of stomach. Cecal stasis. Right lower quadrant adhesions. Suggests chronic appendicitis. Fecal stasis.

Case 29.—Boy, aged 17. Acne severe, duration one year. No gastro-intestinal symptoms. Bowels constipated. (1) Gastric examination: Fasting stomach: 10 c.c.; free hydrochloric acid positive; Hausmann's test and microscopic starch negative. Test breakfast: Free acid, 49; total acid, 79. (2) Roentgen examination: Stomach just to crest. Normal in size. Hyperperistalsis and motility. No cecal stasis. Transverse colon in good position. Spastic transverse colon.

Summary.—Hyperchlorhydria; spastic, transverse colon (suggesting mucous colitis).

Case 30.—Boy, negro, aged 21. Acne medium, duration one year. Patient sometimes belches sour food after meals. Bowels constipated, except for past two weeks. (1) Gastric examination: Fasting stomach; 5 c.c.; free hydrochloric acid present; Hausmann's test and microscopic starch positive. Test breakfast (refused). (2) Roentgen examination: Normal intestinal picture.

COMMENT

In an analysis of our cases, presented in the accompanying table, it is seen that those showing gastric abnormalities, 93 per cent., are somewhat greater in number than the ones showing intestinal abnormalities, 70 per cent. The most common gastric findings were hyperacidity, 48.1 per cent.; retention, 36.6 per cent.; atony, 33.3 per cent., and ptosis, 40.0 per cent. The most common intestinal findings were cecal stasis, 46.6 per cent.; ptosis of the colon, 36.6 per cent., and right lower quadrant adhesions, 23.3 per cent. Clinically, 63.3 per cent. of the cases gave evidence of gastric disturbances, and 40 per cent. of them were constipated.

It is rather striking that none of the cases examined gave entirely normal gastro-intestinal findings. These findings, however, in a few of the cases were of such mild degree or nature that they could not be considered as giving rise to any pathologic state.

Since the most important factors (as subacidity, gastric and intestinal ptosis, atony, adhesions and cecal stasis), which would probably predispose to acne, are those which permit gastric or intestinal retention followed by toxic absorption, we have therefore selected from our cases those which show these abnormalities to such a degree that a basis for toxic absorption can definitely be presumed to exist. There are twenty of

PRINCIPAL GASTRO-INTESTINAL FINDINGS IN ACNE VULGARIS

Case No.	Age	Sex	Degree*	Duration	Gastric Disturbances, Clinical	Gastric Acidity				Gastric Secretion			Gastric Tone			Gastric Motility		Gastric Position		Intestinal Findings						Remarks
						Normal	Hyperacidity	Hyperacidity	Achylia	Normal	Hypersecretion	Retention	Orthotonic	Hypertonic	Atonic	Hypermotility	Hypomotility	Normal	Gastroptosis	Constipation, Clinical	Cecal Stasis	Coloptosis	Atonic Colon	Spastic Colon	R. L. Q. Adhesions	Gastric Reflexes	
1	15	M	A	6 mo.	+	..	+	..	..	+	..	..	..	..	+	..	+	..	+	+	+	+	..	..	+	Pyloro-spasm	Chronic appendix
2	17	F	M	6 mo.	..	+	..	..	..	..	+	..	..	..	+	..	+	+	..	+	+	..	..	..	+		
3	20	F	A	5 yrs.	+	+	..	..	..	..	+	..	..	..	+	..	..	..	+	+	+	..	..	..	+		
4	20	F	A	6 yrs.	+	..	+	..	..	..	+	..	..	..	+	..	+	..	+	+	+	+	..	..	..		
5	18	F	A	2 yrs.	+	..	..	+	..	..	+	..	..	+	..	..	+	..	+	+							
6	15	M	M	2 mo.	..	..	+	..	..	..	+	..	..	+	..	..	+	..	+	..	..	+	..	..	..		
7	19	M	A	1 yr.	+	..	..	+	..	..	+	..	..	+	..	..	+	..	+	+							
8	17	F	S	2 yrs.	+	..	..	+	..	..	+	..	..	+	..	..	+	..	+	+	+	+	..	..	..		
9	16	F	S	1 yr.	+	..	+	..	..	+	..	..	+	..	..	..	..	+	..	..	..	..	..	+	..	.....	Mucous colitis
10	19	F	M	5 yrs.	..	+	..	..	..	..	+	..	+	..	..	..	..	+	..	..	+	+	..	..	..		
11	23	F	S	2 yrs.	..	..	+	..	..	+	..	..	..	..	+	..	+	..	+	..	..	+	..	..	..		
12	19	M	A	1 yr.	..	..	+	..	..	+	..	..	..	..	+	..	+	..	+	..	+	+	..	+	+		
13	21	M	A	5 yrs.	..	..	+	..	..	..	+	..	..	+	..	..	..	..	+	+							
14	15	M	A	2 yrs.	+	..	+	..	..	..	..	+	+	..	..	..	..	+	..	..	+	+	..	..	+	.....	Chronic appendix
15	19	M	A	3 yrs.	+	..	+	..	..	..	..	+	+	..	..	..	+	..	..	..							
16	13	M	A	2 yrs.	+	..	+	..	..	..	..	+	..	+	..	..	+	..	..	+							
17	14	M	M	6 mo.	..	+	..	..	..	..	..	+	..	..	..	..	+	..	..	..	..	..	..	..	+	.....	Chronic appendix
18	21	M	A	3 yrs.	+	+	..	..	..	..	..	+	..	+	..	+	..	+	..	..	+	..	..	..	+	Pyloro-spasm	Chronic appendix
19	15	F	M	2 yrs.	+	+	..	..	..	..	+	..	..	+	..	..	..	+	..	+	..	..	..	..	+	Pyloro-spasm	Chronic appendix
20	21	F	M	8 yrs.	+	+	..	..	..	..	+	..	+	..	..	..	..	+	..	+	..	..	..	..	+		
21	21	F	M	2 yrs.	+	..	+	..	..	+	..	..	+	..	..	..	..	+	..	+							
22	18	M	S	3 yrs.	..	..	..	+	..	+	..	..	..	..	+	..	+	..	..	..							
23	20	F	S	5 yrs.	+	..	+	..	..	+	..	..	..	..	+	..	+	..	+	+	+	..	..	..	..		
24	18	F	M	2 yrs.	..	+	..	..	..	+	..	..	..	+	..	..	+	..	..	+							
25	25	F	M	3 yrs.	+	+	..	..	..	+	..	..	+	..	..	..	+	..	..	+							
26	20	F	A	1 yr.	..	..	+	..	..	+	..	..	..	+	..	..	+	..	..	+	+	+	..	..	..		
27	18	F	M	5 mo.	+	†	†	†	..	..	..	+	..	..	+	..	+	..	+	..	+	+					
28	19	F	A	1 yr.	+	†	†	†	..	..	..	..	+	..	..	..	..	+	..	+							
29	17	M	S	1 yr.	..	..	†	†	..	+	..	..	+	..	..	..	..	+	..	+							
30	21	M	A	1 yr.	+	†	†	†	..	..	..	+	..	+	..	..	..	+	..	..	+	+	..	..	+		
Number						19	11	13	3	9	15	6	11	12	8	10	4	10	18	12	12	14	11	0	3	7		
Percentage						63.3	10.7	48.1	11.1	0	43.3	20.0	36.6	40.0	26.6	33.3	13.3	33.3	60.0	40.0	40.0	46.6	36.6	0	10.0	23.3		

* A signifies average; M, mild; S, severe.

† Test meal refused.

these cases, Nos. 1, 3, 4, 6, 8, 10, 11, 12, 14, 15, 17, 18, 19, 20, 22, 23, 25, 26, 27 and 28, which constitutes 60 per cent. of the total.

Our observations are too limited to draw any very definite conclusions as to the nature of the relations between acne vulgaris and gastro-intestinal abnormalities but we feel that our results show that the well established clinical observations as to the association of these conditions have, in many cases, a well-founded pathologic basis.

CONCLUSIONS

1. Acne vulgaris is generally conceded to be caused by the presence and growth of the acne bacillus.

2. There are a number of predisposing factors to this disease, one of the most important of which is gastro-intestinal derangements.

3. In a series of thirty cases of acne vulgaris, which were examined from the gastro-intestinal side, by test meals and fluoroscopic observations, we found that none of them gave absolutely normal findings, and that 60 per cent. of the cases showed abnormalities which were of such a nature as to permit gastric and intestinal stasis followed by toxic absorption.

529 North Charles Street—1100 North Charles Street.

ABSTRACT OF DISCUSSION

DR. MICHAEL LEO RAVITCH, Louisville, Ky.: While the gastro-intestinal tract may have some influence as a causative factor in acne, I do not believe it is a very potent one. Judging from the fact that acne usually makes its appearance about puberty, I think the gastro-intestinal tract can be ruled out as a very important or primal factor. About this period of life glandular activity is very marked; but what causes this glandular hyperactivity we do not know. I have seen many cases of acne that failed to improve under various modifications of diet, no matter how strictly they have been followed.

DR. H. H. HAZEN, Washington, D. C.: From the results of this work we are justified in deducing at least one conclusion, namely, that stasis or other abnormal conditions of the gastro-intestinal tract are not such important factors in the causation of acne vulgaris as some writers would have us believe.

DR. WALTER J. HEIMANN, New York: Dr. H. J. Schwartz and I found hyperglycemia in 60 per cent. of the seborrheas, including acne. In a very large proportion of cases of acne there are gastro-intestinal disturbances, chiefly either hyperacidity or carbohydrate fermentation. It is possible that these may be associated with the disturbed sugar metabolism. Perhaps a combination of these ideas with those outlined by Drs. Ketron and King will ultimately lead us to an understanding of the underlying cause, if not to that of the local cause, which may be the acne bacillus.

DR. LLOYD W. KETRON, Baltimore: We have no claims to set forth. We simply wish to present the facts for what they are worth. It is probable that patients with eczema or some other skin diseases may show just as high a percentage of intestinal derangements as do acne cases. Our figures show that a large percentage of these patients suffer from intestinal stasis and retention, and under these conditions we would be more apt to meet with deranged protein metabolism.

Superstition.—In some parts of France there was formerly a custom of covering a newly born infant with salt in order to conduce to longevity; the salt was allowed to remain on for two or three days, and then was washed off with wine and water. The academician St. Aulaire was so treated as an infant, and undoubtedly lived to be very old. Pythagoras regarded honey as conducive to long life, and, according to Hufeland, the Egyptians prescribed courses of emetics with the same object.—Saundby.

New Instruments and Suggestions

USE OF CITRATED PLASMA IN TISSUE CULTURES

PRELIMINARY REPORT*

N. CHANDLER FOOT, M.D., BOSTON
Instructor in Pathology, Harvard Medical School

The Burrows-Carrel method of cultivating tissue in coagulated plasma at body temperature[1] is already so well known that in describing a modification of it I shall merely touch on those points in the procedure which are affected thereby.

While the method gives almost perfect results in the laboratory in connection with animal experimentation, it unfortunately has its drawbacks when one wishes to apply it to work on the human subject in the hospital. In the first place, one must have a powerful centrifuge at hand, so that the blood may be centrifugalized without loss of time; otherwise it is apt to clot during the process. If the donor can come to the laboratory, this is easy; but if the blood is to be collected in a distant ward and brought to the laboratory, one often finds it clotted on removing it from the machine. The necessity of providing cracked ice or snow is often rather inconvenient, and the fact that this frequently melts almost completely during centrifugalizing makes it liable to spill into the tubes and contaminate their contents. Lastly, the necessity for paraffining and chilling all the glassware used during the preparation of the plasma is also more or less troublesome.

While one is working in a hospital it is not always easy to be on hand when a venesection is to be performed, nor is it always possible to be ready with cracked ice and paraffined glassware at such a time. On the other hand, as venesections are frequently done, or blood is obtained for Wassermann or other tests by the hospital staff, it occurred to me some time ago that it would be very easy for an intern to obtain such blood at any convenient time were it treated with some anticoagulant, such as sodium citrate, and set aside till wanted by the experimenter.

It has been shown that such blood can readily be recoagulated at will by the addition of a solution containing calcium; and modern researches on transfusion have demonstrated the tolerance of the human organism for citrated blood. The conclusion is obvious: why not use citrated plasma for cell cultures, recoagulating it on the coverslip by the addition of a calcium solution? To test out the feasibility of this idea, I began experimenting along these lines with perfectly satisfactory results, apparently in no way inferior to those obtained by the use of the original method.

The blood to be used is collected in tubes or flasks containing enough of a 0.2 or 0.3 per cent. solution of sodium citrate to make the total amount of the mixture contain one part of this to nine parts of blood. It may be drawn direct from the vein, through a cannula (preferably oiled), or into a syringe containing a sufficient quantity of the citrate solution, care being exercised to insure a thorough mixture of the blood with the citrate solution. The blood so collected is then centrifugalized for from ten to fifteen minutes in a powerful machine (the ordinary hand centrifuge is usually too slow for this work), and the resulting plasma decanted or pipetted into a flask which is then put away on ice, or in a cool place until wanted. I have always used paraffined flasks for this purpose, as the paraffin tends to prevent clotting. It will remain fluid and usable for a considerable time, a week or two at any rate.

The cultures are prepared in the usual way, a drop of the plasma being mixed on the coverslip with an equal amount of Ringer's or Locke's solution, the amount of calcium chlorid in these being increased ten times (from 0.025 to 0.25) in order to provide the excess of calcium necessary to overcome

* From the Department of Pathology, Harvard Medical School, and the Pathological Laboratory of the Peter Bent Brigham Hospital.

1. Abderhalden, E.: Handbuch der biochemischen Arbeitsmethoden, 1912, v, Pt. 2. Carrel, A., and Ingebrigtsen, R.: Jour. Exper. Med., 1912, xv, 287.

the anticoagulant action of the sodium citrate. Further experimentation may prove that a lesser amount of calcium will be equally effective; it is certain, however, that the usual percentage of calcium chlorid present in Ringer's or Locke's solution is insufficient to bring about prompt clotting. The addition of the tissue particle to a drop of pure undiluted citrated plasma is often sufficient to bring about coagulation after a considerable length of time; the clot thus formed is, however, of very soft consistency, and not so suitable for subsequent fixing and staining as are those prepared with the excess of calcium chlorid. It has been customary to use some tissue extract, preferably embryonal, as an activator to cell growth. In preparing such an extract I have employed the modified Ringer's or Locke's solution described above, using 1 drop of the extract to 1 drop of citrated plasma.

Thus far I have experimented chiefly with human carcinoma (ovarian and intra-uterine), obtaining satisfactory cultures in the majority of cases. These were in every respect similar to the cultures of mouse carcinoma described by various experimenters, and they also resembled the cultures of human carcinoma hitherto described, save in one respect; there was no liquefaction of the plasma clot under one week, whereas in the original method this occurs within a day or two. The cells grew out from the implant in sheets of one or more layers in every way similar to those seen in peritoneal and lymphatic extensions of carcinoma in the human body. The stroma participated in the growth, but was never a predominant factor. Nuclear figures were plentiful in the carcinoma cells and present in the stroma outgrowths; they were very irregular and atypical in many cases; but a large number of typical mitoses were found. It is possible to carry out all the steps of tissue cultivation, such as transplantation and washing, the use of citrated plasma in no way interfering with the processes as formerly practiced. Fixation and staining are likewise not affected thereby.

TAKING FOOTPRINTS WITHOUT INK

J. H. TAYLOR, Washington, D. C.

A maternity hospital in Chicago has adopted the footprint as a means of identifying its tiny charges. The Chicago hospital takes the footprint of every infant that is born or brought there before the baby is an hour old. The present way of obtaining a baby's footprint is to spread some printer's ink on a printer's roller and run it over the baby's foot; then the foot is pressed against a sheet of white paper, which leaves the impression desired. After the impression is obtained, the ink remaining on the baby's foot has to be removed by washing with absorbent cotton saturated with alcohol or benzin.

In order to obviate the use of ink, the baby's foot should be rubbed with cold cream. Then a sheet of plain white paper is pressed against the bottom of the foot so that the entire surface of the sole of the foot comes in contact with the paper. After this is done powdered charcoal is spread with a camel's hair brush over the surface of the paper touched by the baby's foot, which will bring the latent impression out as plain as if taken in the old way with ink. By this process the same result is obtained and the infant's foot is not even soiled. The impression obtained, if placed in an envelope, will keep until the time when the mother and infant are ready to leave the hospital. An impression made by using powdered charcoal takes less time than by the use of printer's ink. This method could also be used to determine the degree of flatness of a person's foot.

516 Navy Building.

Liver Pills.—Liver pills (they do not act on the liver) are usually distinctly harmful in the conditions for which they are usually taken, sluggish bowels. *Once a liver pill taker, always a liver pill taker, is the rule.* A condition which often can be readily corrected by proper diet and exercise is thus rendered chronic and sometimes almost incurable by remedies advertised to relieve it.—*Health Letter*, Life Extension Institute.

Special Article

FOURTEENTH ANNUAL SUMMARY OF FOURTH OF JULY INJURIES

For the fourteenth consecutive year, THE JOURNAL presents statistics of deaths and injuries resulting from the celebration of the Fourth of July. With the rapid decline in the number of casualties in the last few years, instead of relaxing its vigilance, THE JOURNAL has made extra effort to secure complete and accurate data. Blanks sent to hospitals for reports were returned with short lists or with the statement that no cases whatever were treated. Health officers, also, who formerly sent in long lists of killed and injured, likewise had no names to report. On many of the blanks was written the significant statement: "We had a safe and sane Fourth." The data are presented in the same manner as heretofore, and in each table the comparison shows the remarkable decrease during the last few years in the number of deaths and injuries from the use of fireworks.

TABLE 1.—TETANUS CASES BY STATES
Comparison with Previous Years

	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	Total
Alabama	..	..	1	..	..	..	..	..	..	..	..	..	..	1
Arizona	..	..	..	..	1	..	..	..	..	..	..	..	..	1
California	2	4	4	3	1	..	2	1	2	1	..	..	..	20
Colorado	4	..	1	..	..	..	..	..	..	..	..	..	..	5
Connecticut	3	..	3	..	4	1	..	..	..	..	..	..	..	11
Delaware	..	..	1	1	1	..	2	..	..	..	..	..	..	5
Dist. of Col.	1	..	..	..	..	..	..	..	..	..	..	..	..	1
Florida	..	..	..	..	..	..	1	..	..	..	..	..	..	1
Georgia	..	..	..	..	1	..	..	..	..	..	..	..	..	1
Idaho	1	..	..	..	..	..	1	..	..	..	..	..	..	2
Illinois	49	15	20	16	12	12	20	10	3	..	..	..	..	157
Indiana	7	6	3	8	2	..	9	6	..	1	1	..	..	47
Iowa	14	2	3	4	4	1	1	1	1	..	..	..	..	31
Kansas	11	1	..	..	2	1	6	..	..	1	..	..	..	22
Kentucky	4	2	..	1	..	1	1	..	..	..	1	..	..	10
Louisiana	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Maine	2	4	1	1	..	1	1	..	..	..	..	1	..	12
Maryland	1	..	1	1	..	..	2	1	..	..	..	..	..	6
Mass.	16	5	7	3	2	5	8	..	1	1	..	..	..	48
Michigan	29	7	9	4	4	2	11	11	2	1	..	..	..	80
Minnesota	15	2	2	2	2	..	..	..	..	..	..	1	..	24
Missouri	29	1	3	3	1	5	8	2	..	..	..	..	..	52
Montana	2	1	1	..	1	..	3	2	..	..	..	..	..	10
Nebraska	4	3	3	1	..	1	3	1	..	..	..	..	..	16
New Hamp.	1	..	..	1	..	..	1	..	..	..	..	..	..	4
New Jersey	8	9	3	10	8	10	19	9	2	..	1	..	..	79
New York	36	9	6	8	4	9	11	7	1	..	2	..	..	93
N. Dakota	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ohio	67	9	5	..	6	7	12	3	3	..	..	..	..	119
Oklahoma	1	..	1	1	1	1	1	1	..	1	..	..	..	6
Oregon	2	..	..	1	1	1	..	..	..	..	..	..	..	5
Pennsylv'ia.	82	17	12	5	7	7	10	11	1	..	..	..	..	152
Rhode Isl.	3	..	..	1	..	..	..	..	..	..	..	..	..	4
S. Carolina	..	..	..	..	..	..	..	..	..	..	..	..	..	..
S. Dakota	..	..	..	..	..	1	1	..	..	..	..	..	..	2
Tennessee	..	..	..	4	..	..	..	..	..	..	..	..	..	..
Texas	..	..	..	..	2	..	..	..	..	..	..	..	..	2
Utah	..	1	1	..	..	..	..	1	..	..	..	..	..	3
Vermont	3	2	..	2	2	..	..	..	..	..	..	..	..	9
Washington	2	1	..	..	2	4	4	1	..	..	..	..	..	14
W. Virginia	3	..	..	2	..	1	4	..	..	2	..	..	..	12
Wisconsin	10	4	13	2	3	5	9	3	2	..	..	..	..	51
Wyoming	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Total	417	105	164	89	73	76	150	72	18	7	4	3	1	1,119
States having cases	30	21	23	25	23	20	25	18	10	6	3	3	1	

FIRST YEAR WITHOUT A LOCKJAW VICTIM

This is the first year in which not a single case of lockjaw was reported. A few cases were reported, in which it was feared tetanus would result, but the prompt use of antitoxin as a prophylactic doubtless prevented it.

TETANUS CASES OF PREVIOUS YEARS BY STATES

The various tables are printed again to show the totals for the fourteen years. Table 1 shows the cases reported in all previous years since 1903 and the totals. Although Pennsylvania had the largest numbers in 1903 and 1904, thereafter until 1910 Illinois reported the largest numbers. In fact, Illinois had the largest number of tetanus cases in the thirteen years, having reported 157 cases, followed closely by Pennsylvania, with 152. Ohio reported 119; New York, 93; Michigan, 80; New Jersey, 79; Missouri, 52; Wisconsin, 51, and Massachusetts, 48. Altogether, in the thirteen years, 1,119 tetanus cases were reported as due to injuries resulting from the use of fireworks in celebrating the Fourth of July, and of this number, 991 patients died.

TABLE 2.—RATIO OF TETANUS CASES TO BLANK CARTRIDGE INJURIES

Year	Tetanus Cases	Blank Cartridge Injuries	Ratio
1903	417	1,672	1: 4.01
1904	105	965	1: 9.62
1905	104	809	1: 7.78
1906	89	979	1: 11.00
1907	73	666	1: 9.16
1908	76	874	1: 11.70
1909	150	1,225	1: 8.17
1910	72	450	1: 6.25
1911	18	185	1: 10.28
1912	7	77	1: 11.00
1913	4	101	1: 25.25
1914	3	124	1: 41.33
1915	1	295	1:295.0
Totals	1,119	8,487	1: 7.58

BLANK CARTRIDGE WOUNDS AND TETANUS

The proportion of blank cartridge injuries to the cases of lockjaw reported during the thirteen years is given in Table 2. The two years in which the largest numbers of lockjaw cases were reported were 1903 and 1909, when also the two largest numbers of blank cartridge wounds were reported. In 1903 one case of lockjaw resulted from every four blank cartridge injuries, and in 1909, one case from every eight injuries. The proportion of cases to blank cartridge injuries in the entire thirteen years was 1 to every 7½ blank cartridge injuries. The one case in 1915 was due to this cause, although there were 295 blank cartridge wounds. The decreasing proportion of tetanus cases to such injuries in the last three or four years was doubtless due to the more general and prompt use of antitoxin in such injuries.

TABLE 3.—CAUSES OF TETANUS CASES

Year	Blank Cartridge	Giant Cracker	Cannon	Firearms	Powder, etc.	Total
1903	363	17	5	3	29	417
1904	74	18	5	1	7	105
1905	65	17	4	5	13	104
1906	54	17	1	7	10	89
1907	52	8	6	4	3	73
1908	58	5	4	3	6	76
1909	130	9	1	4	6	150
1910	64	2	..	5	1	72
1911	15	1	1	..	1	18
1912	7	..	..	..	..	7
1913	4	..	..	..	..	4
1914	2	..	..	1	..	3
1915	1	..	..	..	..	1
Totals	889	94	27	33	76	1,119

CAUSES OF LOCKJAW CASES

The causes of all tetanus cases during the thirteen years are shown in Table 3. Of the 1,119 cases of lockjaw from Fourth of July injuries reported for the thirteen years, 889 (79.4 per cent.) were caused by wounds from blank cartridges; 94 (8.4 per cent.) from giant crackers; 76 (6.9 per cent.) from powder

TABLE 4.—CASES OF TETANUS FROM OTHER CAUSES

	1908	1909	1910	1911	1912	1913	1914	1915	1916
Alabama	..	..	1	1	..	..	..	..	..
Arizona	..	..	..	..	..	1	..	..	..
Arkansas	2	..	..	..	..	..	..	..	..
California	4	4	1	2	7	10	..	1	2
Colorado	3	..	..	1	..	..	..	..	..
Connecticut	2	2	..	..	..	..	..	..	..
Delaware	..	1	..	..	..	..	..	..	..
Dist. of Columbia	..	..	..	..	..	..	..	..	..
Florida	2	..	..	..	..	..	..	..	..
Georgia	..	1	..	..	..	..	..	1	..
Idaho	..	..	..	..	..	..	..	..	..
Illinois	17	18	7	6	10	7	..	..	..
Indiana	6	4	1	2	1	3	1	1	2
Iowa	2	7	2	1	..	2	1	..	1
Kansas	4	..	1	..	..	..	..	..	..
Kentucky	5	5	..	1	2	..	3	1	..
Louisiana	1	..	..	1	3	3	..	..	1
Maine	..	..	..	..	..	..	..	..	..
Maryland	3	..	2	1	1	..	..	..	..
Massachusetts	3	5	..	..	..	..	..	..	..
Michigan	4	5	1	..	..	..	1	..	..
Minnesota	4	2	..	..	..	..	..	..	..
Mississippi	..	..	..	..	..	..	..	..	..
Missouri	12	5	1	2	2	..	..	2	..
Montana	..	..	..	..	..	..	..	..	..
Nebraska	..	3	1	1	1	..	..	..	..
Nevada	..	..	..	..	..	..	..	..	..
New Hampshire	..	..	..	..	..	..	..	..	..
New Jersey	7	8	1	..	..	..	2	..	..
New Mexico	..	1	..	..	..	..	..	..	..
New York	17	12	4	2	4	..	2	..	1
North Carolina	1	..	..	..	..	1	..	..	..
North Dakota	1	..	..	..	..	..	..	..	..
Ohio	23	12	2	..	2	1	2	..	..
Oklahoma	..	..	..	..	..	..	..	..	..
Oregon	..	1	2	..	2	..	..	..	..
Pennsylvania	21	21	8	6	4	1	2	2	1
Rhode Island	..	1	..	..	..	..	..	..	..
South Carolina	..	..	..	..	..	..	..	..	..
South Dakota	2	2	..	..	..	..	..	..	..
Tennessee	3	..	..	..	1	1	..	..	..
Texas	4	1	1	..	..	..	..	..	..
Utah	..	..	..	..	..	..	..	..	..
Vermont	..	..	1	..	..	..	..	..	..
Virginia	1	1	..	1	2	1	..	..	..
Washington	2	..	..	..	1	..	..	..	..
West Virginia	..	1	..	..	..	..	..	..	..
Wisconsin	5	4	1	..	..	1	..	1	2
Wyoming	..	..	..	..	..	..	..	..	..
Totals	166	128	47	29	44	32	16	10	10
States reporting cases	29	25	18	15	15	12	8	7	7

TABLE 5.—CAUSES OF DEATHS NOT DUE TO TETANUS

Year	Gunshot	Fire from Fireworks	Powder, Torpedoes, etc.	Giant Crackers	Cannon	Other Causes	Total
1903	37	23	6	5	7	17	95
1904	38	18	18	3	3	7	87
1907	20	31	13	13	3	22	102
1908	30	22	19	23	7	7	108
1909	17	37	16	7	7	6	90
1910	19	26	11	2	3	3	64
1911	11	12	9	2	5	8	47
1912	9	8	7	2	2	7	35
1913	8	13	6	..	1	1	29
1914	5	16	6	1	4	5	37
1915	5	11	5	..	6	2	29
1916	9	10	3	1	4	3	30
Totals	208	227	119	59	52	84	749

In the summaries for 1903 and 1904 there were, respectively, 60 and 92 deaths from fireworks exclusive of tetanus. The causes of the injuries were not given. With these included the total deaths in the fourteen years aside from tetanus were 991.

and explosives; 33 (2.9 per cent.) from firearms, and 27 (2.4 per cent.) from toy cannons. In other words, over three times as many lockjaw cases were due to blank cartridge injuries as to all other injuries put together.

TETANUS CASES NOT DUE TO FIREWORKS

Tetanus cases reported during the Fourth of July season but which were due to other causes, such as crushing injuries or penetrating wounds from splinters, nails, etc., are shown in Table 4. The number of such cases is likewise decreasing each year, owing probably to more care being taken in the treatment of penetrating wounds as well as to the prophylactic use of antitoxin. No case from fireworks was reported.

OTHER DEATHS AND INJURIES FROM FIREWORKS

There were thirty deaths directly due to fireworks. The causes of deaths, other than from tetanus, are shown in Table 5, in comparison with the numbers due to similar causes in previous years. Of these, ten persons were burned to death by fire from fireworks, nine were from gunshot wounds, four from explosions of toy cannons, three from explosions of powder, three from bloodpoisoning following more

TABLE 6.—SUMMARY BY STATES OF FOURTH OF JULY CASUALTIES

Marginal Number	States	Deaths			Injuries						Total Persons Dead or Injured	Causes of Tetanus Cases		Causes of all Cases Aside from Tetanus Cases				Marginal Number
		From Tetanus	From Other Causes	Total	Loss of Sight	Loss of One Eye	Loss of Legs, Arms or Hands	Loss of Fingers, One or More	Other Injuries	Total Not Fatal Injuries		Blank Cartridge	All Other Causes	Blank Cartridge	Firecracker	Cannon	Firearms	Powder and Fireworks	
1	Alabama	....	....	.....	....	....	....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	1
2	Arizona	....	....	.....	....	....	....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	2
3	Arkansas	....	....	.....	....	....	....	.....	1	1	1	....	....	.....	.....	.....	.....	1	3
4	California	....	....	.....	....	2	2	1	29	34	34	....	....	.....	8	4	3	19	4
5	Colorado	....	....	.....	....	....	....	.....	2	2	2	....	....	.....	.....	2	.....	.....	5
6	Connecticut	....	3	3	....	....	1	4	70	75	78	....	....	42	7	5	12	12	6
7	Delaware	....	....	.....	....	....	....	.....	2	2	2	....	....	.....	.....	.....	1	1	7
8	District of Columbia	....	....	.....	....	....	....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	8
9	Florida	....	1	1	....	....	....	.....	.....	.....	1	....	....	.....	.....	.....	1	.....	9
10	Georgia	....	....	.....	....	....	....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	10
11	Idaho	....	....	.....	....	....	....	.....	1	1	1	....	....	.....	.....	.....	.....	1	11
12	Illinois	....	2	2	....	....	....	2	19	21	23	....	....	.....	5	1	4	13	12
13	Indiana	....	1	1	....	....	....	.....	3	3	4	....	....	.....	2	1	.....	1	13
14	Iowa	....	1	1	....	1	....	.....	9	10	11	....	....	.....	8	1	.....	2	14
15	Kansas	....	....	.....	....	1	....	.....	2	3	3	....	....	1	2	.....	.....	.....	15
16	Kentucky	....	....	.....	....	....	....	.....	6	6	6	....	....	3	1	.....	.....	2	16
17	Louisiana	....	....	.....	....	....	....	.....	7	7	7	....	....	.....	.....	.....	.....	7	17
18	Maine	....	....	.....	....	....	....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	18
19	Maryland	....	....	.....	....	....	....	.....	15	15	15	....	....	1	3	.....	4	7	19
20	Massachusetts	....	5	5	....	2	1	1	63	67	72	....	....	7	13	7	11	34	20
21	Michigan	....	3	3	....	1	1	.....	17	19	22	....	....	1	15	1	4	1	21
22	Minnesota	....	....	.....	....	....	....	.....	4	4	4	....	....	1	2	1	.....	.....	22
23	Mississippi	....	....	.....	....	....	....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	23
24	Missouri	....	1	1	....	1	....	1	39	41	42	....	....	20	9	2	4	7	24
25	Montana	....	1	1	....	....	....	.....	.....	.....	1	....	....	.....	1	.....	.....	.....	25
26	Nebraska	....	....	.....	....	....	....	.....	6	6	6	....	....	.....	2	1	.....	5	26
27	Nevada	....	....	.....	....	....	....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	27
28	New Hampshire	....	....	.....	....	....	....	.....	2	2	2	....	....	.....	1	1	.....	.....	28
29	New Jersey	....	1	1	....	....	....	2	26	28	29	....	....	7	9	3	1	9	29
30	New Mexico	....	....	.....	....	....	....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	30
31	New York	....	2	2	....	....	....	5	164	169	171	....	....	65	31	16	26	33	31
32	North Carolina	....	....	.....	....	....	....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	32
33	North Dakota	....	....	.....	....	....	....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	33
34	Ohio	....	1	1	....	1	2	.....	18	21	22	....	....	1	4	8	4	5	34
35	Oklahoma	....	....	.....	....	....	....	.....	1	1	1	....	....	.....	1	.....	.....	.....	35
36	Oregon	....	2	2	....	....	....	.....	3	3	5	....	....	.....	1	1	.....	3	36
37	Pennsylvania	....	6	6	....	1	1	5	204	211	217	....	....	29	74	20	37	57	37
38	Rhode Island	....	....	.....	....	....	....	1	11	12	12	....	....	3	2	4	3	.....	38
39	South Carolina	....	....	.....	....	....	....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	39
40	South Dakota	....	....	.....	....	....	....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	40
41	Tennessee	....	....	.....	....	....	....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	41
42	Texas	....	....	.....	....	....	....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	42
43	Utah	....	....	.....	....	....	....	.....	2	2	2	....	....	.....	.....	.....	.....	2	43
44	Vermont	....	....	.....	....	....	....	.....	4	4	4	....	....	.....	.....	.....	1	3	44
45	Virginia	....	....	.....	....	....	....	.....	1	1	1	....	....	.....	.....	.....	.....	1	45
46	Washington	....	....	.....	....	....	1	1	10	12	12	....	....	.....	8	.....	2	2	46
47	West Virginia	....	....	.....	....	....	....	1	13	14	14	....	....	4	4	1	1	4	47
48	Wisconsin	....	....	.....	....	....	....	.....	21	21	21	....	....	.....	9	3	.....	9	48
49	Wyoming	....	....	.....	....	....	....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	49
50	1916 totals	....	30	30	....	10	9	24	777	820	850	....	....	185	222	84	118	241	50
51	1915 totals	1	29	30	1	11	5	38	1,086	1,135	1,165	1	0	294	227	93	100	450	51
52	1914 totals	3	37	40	3	13	16	67	1,367	1,466	1,506	2	1	122	407	143	231	565	52
53	1913 totals	3	29	32	2	22	10	46	1,051	1,131	1,163	4	0	97	312	62	169	519	53
54	1912 totals	6	35	41	8	21	13	43	862	947	988	7	0	70	362	75	157	317	54
55	1911 totals	10	47	57	8	26	30	83	1,260	1,546	1,603	15	3	170	484	114	184	633	55
56	1910 totals	67	64	131	7	33	26	114	2,613	2,792	2,923	64	8	386	1,050	212	229	974	56
57	1909 totals	125	90	215*	16	36	41	176	4,823	5,092	5,307	130	20	1,095	1,614	427	341	1,880	57
58	1908 totals	55	108	163	11	33	57	184	5,115	5,460	5,623	56	18	816	1,793	369	481	2,058	58
59	1907 totals	62	102	164	12	75	57	237	3,868	4,249	4,413	52	21	554	1,480	267	502	1,528	59
60	1906 totals	73	83	156	22	72	56	227	4,931	5,308	5,466	54	35	925	1,690	408	532	1,622	60
61	1905 totals	87	95	182	25	106	80	221	4,562	4,904	5,176	65	39	744	1,775	474	404	1,675	61
62	1904 totals	91	92	183	19	61	61	208	3,637	3,986	4,169	74	25*	831	1,268	508	406	1,057	62
63	1903 totals	466	60	466	10	75	54	174	3,670	3,983	4,449	362	29†	1,309	1,152	397	226	363	63
	Totals for 14 years	901	901	1802	144	654	515	1842	29,754	42,909	44,801	889	199	7,568	13,840	3,663	4,000	14,822	

* Kind of fireworks causing six tetanus cases unknown.

† Kind of fireworks causing twenty-four cases of tetanus unknown.

or less minor injuries from fireworks, and one was killed by a mammoth firecracker. The total shows an increase of one more than last year and one more than in 1913. It is lower than the totals in all other years. The most serious fact presented this year is that ten persons, mostly little girls or small children, were burned to death by fire from fireworks, most cases being caused by the supposedly "harmless" varieties.

Of the 749 deaths from Fourth of July injuries, other than from tetanus, in the twelve years, 227, the largest number, were burned to death; 208, the next largest number, were killed by firearms; 119 by explosives; 59 and 52, respectively, by giant crackers and toy cannons, and 84 persons by various forms of fireworks, some of these injuries having been complicated by bloodpoisoning. Altogether, in the fourteen years, 901 persons died from injuries not complicated by tetanus. Including the 991 deaths from tetanus gives a total of 1,892 persons who died, through a silly and destructive method of celebrating the Fourth of July.

DISTRIBUTION OF INJURIES

In Table 6 a summary of all injuries, including tetanus, and of all causes, is given arranged by states. Beneath the totals at the bottom, for comparison, the totals for the thirteen previous years are given and the grand totals for the fourteen years. The number of casualties this year was 850, the lowest number since the publication of these statistics was begun. It is a decrease of 315 below 1915, and a decrease of 656 below 1914.

NATURE OF NONFATAL INJURIES

There were 820 nonfatal injuries this year, or 315 less than last year, and 646 less than in 1914. Not a single person was totally blinded this year, whereas ten lost one eye each, nine lost legs, arms or hands, and twenty-four lost one or more fingers. The totals of these more severe injuries have markedly decreased during the last few years, the totals this year being the smallest reported during the fourteen years. This year 222 injuries were due to the giant firecracker, which holds the second place in causing nonfatal injuries, but continues to hold the first place as a cause of lacerated wounds. It was responsible for most of the losses of eyes, hands and fingers, but this year caused no deaths. Firearms caused 118 injuries, including nine deaths. As usual, many of these injuries were due to stray bullets from the reckless use of firearms by other persons. The use of cannons, including many of the improvised variety, resulted in eighty-four injuries this year, including four killed. In the thirteen years, a total of 44,801 persons were killed or injured in the celebration of the Fourth of July.

INJURIES BY STATES FOR FOURTEEN YEARS

Table 7 gives for comparison the total injuries by states for the fourteen years. This year Pennsylvania

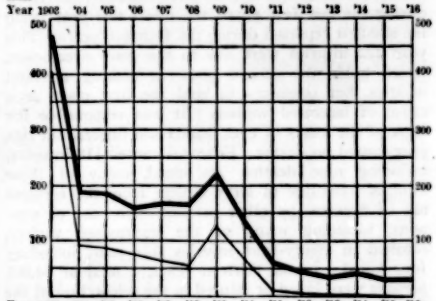
TABLE 7.—TOTAL DEATHS AND ACCIDENTS BY STATES DURING FOURTEEN YEARS

	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	Totals
Alabama	2	7	1	2	1	1	1	3	3	....	1	....	1	....	23
Arizona	1	....	4	5	2	5	3	....	2	2	....	2	2	....	29
Arkansas	....	....	3	4	....	5	1	4	1	1	....	....	....	1	20
California	100	138	142	96	121	136	89	63	43	31	22	24	40	34	1,079
Colorado	20	44	26	23	25	13	18	19	6	21	1	3	3	2	243
Connecticut	162	125	132	109	62	105	96	78	15	30	20	77	40	4	1,257
Delaware	1	5	14	9	16	12	13	8	3	6	6	8	1	2	103
District of Columbia	2	10	24	5	12	21	....	....	....	2	1	1	1	....	79
Florida	1	2	2	....	....	....	1	4	....	....	....	....	....	1	11
Georgia	....	....	....	4	2	4	....	5	10	20	4	....	....	....	57
Idaho	4	4	3	3	4	2	3	1	2	....	1	2	1	....	34
Illinois	366	423	542	508	469	558	547	385	218	39	47	95	54	23	4,363
Indiana	160	211	217	250	....	255	164	167	53	42	12	62	29	4	1,627
Iowa	168	137	328	255	231	174	91	141	54	24	12	27	21	11	1,684
Kansas	63	89	56	61	64	72	89	50	25	8	5	7	2	3	530
Kentucky	30	72	17	21	18	33	17	26	6	5	2	11	5	6	269
Louisiana	....	2	3	7	8	4	....	4	2	2	4	4	1	7	46
Maine	31	32	29	15	11	16	22	7	4	....	6	6	9	....	188
Maryland	71	22	13	10	23	21	10	8	13	11	15	10	22	15	215
Massachusetts	637	193	467	329	168	430	430	62	27	45	42	87	73	72	3,063
Michigan	144	157	288	193	163	203	177	143	69	50	21	72	31	22	1,723
Minnesota	157	101	174	95	95	65	69	64	17	17	6	12	18	4	894
Mississippi	....	....	....	2	2	1	....	....	1	1	....	....	....	....	7
Missouri	147	84	216	325	209	375	352	112	60	57	35	53	46	42	2,255
Montana	5	17	40	3	6	11	9	10	....	6	....	1	2	1	111
Nebraska	46	63	43	47	58	46	42	36	17	12	17	10	3	5	446
Nevada	....	1	2	....	1	4	....	1	....	....	....	....	2	....	11
New Hampshire	37	23	9	29	13	15	23	10	2	3	3	15	4	2	186
New Jersey	228	204	350	308	402	472	488	167	43	16	21	55	36	29	2,509
New Mexico	....	4	5	1	6	....	1	3	....	....	3	....	3	....	26
New York	522	549	566	681	752	647	897	327	237	115	144	250	332	171	6,190
North Carolina	....	....	1	1	....	....	....	1	5	....	....	....	....	....	8
North Dakota	10	8	29	11	8	13	4	13	1	2	....	....	....	....	99
Ohio	443	327	329	490	375	543	322	166	105	55	70	45	13	22	3,306
Oklahoma	0	3	7	14	194	9	12	11	9	11	1	4	1	1	277
Oregon	16	13	9	11	5	9	21	19	3	5	4	5	5	5	120
Pennsylvania	533	744	721	969	491	987	986	623	442	266	491	487	269	217	8,255
Rhode Island	64	30	11	21	39	39	42	19	11	2	21	25	5	12	341
South Carolina	....	....	....	1	....	....	4	....	1	....	....	....	....	....	6
South Dakota	4	10	15	5	8	10	9	4	2	....	1	1	4	....	77
Tennessee	4	1	5	6	4	5	4	10	3	12	3	1	....	....	58
Texas	2	2	4	11	7	11	4	2	....	3	2	....	....	....	48
Utah	23	22	25	18	30	12	18	8	2	1	1	1	2	2	165
Vermont	45	14	10	14	18	19	12	4	4	1	....	2	....	4	149
Virginia	....	11	5	8	....	5	4	....	3	1	....	5	....	1	43
Washington	21	25	15	25	22	38	32	37	22	12	13	5	6	12	286
West Virginia	19	16	34	64	27	29	35	20	2	2	3	8	13	14	286
Wisconsin	190	215	230	155	150	187	187	171	52	28	16	23	22	21	1,627
Wyoming	1	2	8	3	....	1	1	4	4	1	....	....	....	....	25
Totals	4,449	4,169	5,176	5,466	4,413	5,623	5,307	2,923	1,603	988	1,163	1,506	1,165	850	44,801

returns to first place with 217 injuries, temporarily taken away last year by New York. From the beginning Pennsylvania has had the darkest record. During the fourteen years there were 8,255 persons (over eight regiments) injured by fireworks, or over 2,000 more than in New York, which had 6,190 injured—

CHART 1.—TOTAL DEATHS FROM FIREWORKS

The heavy line shows the annual fluctuation in the total number of deaths since 1903. The deaths from lockjaw are indicated by the light line.



Year	1903	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16
Total Deaths	466	182	182	158	164	163	215	131	57	41	32	40	30	30
Lockjaw Deaths	466	91	87	75	62	55	125	67	10	6	3	3	1	0

the next darkest record; Illinois came third with 4,263, followed by Ohio with 3,306, Massachusetts with 3,063, New Jersey with 2,909, and Missouri with 2,255. Thirteen states each had over 1,000 persons injured, the total for these thirteen states alone being over 40,000, all the rest of the country having only approximately 5,000 injured. Altogether, in the fourteen years, 44,801 persons were injured, thousands of whom were maimed for life in the old senseless form of celebration.

TOTALS IN CHIEF CITIES

Table 8 shows the number reported killed and injured in the eighty-four largest cities each year, and the totals for the past ten years. The cities are arranged according to their population as given by the United States census in 1910. Philadelphia, which has been constantly in the lead since 1909, this year shunts the darkest record over to New York, which had one killed and seventy-nine injured. Philadelphia had one killed and seventy-three injured. Note that last year these cities, respectively, had 272 and 280 persons injured.

WHERE THE RESPONSIBILITY RESTS

As has been repeatedly stated in these reports, for the great majority of Fourth of July injuries, *the responsibility clearly rests with city governments*, since the employment of death-dealing methods of celebration is subject to their regulation. The city authorities, therefore, who fail to do their duty must be held *personally responsible* for the maiming and the burning to death of little children from fireworks. Rigidly enforced prohibitive ordinances in forty-three of our largest cities would practically remove this national disgrace.

PROGRESS IN FOURTEEN YEARS

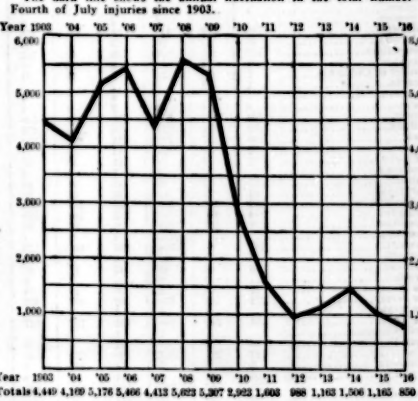
The results of publishing these statistics for fourteen years are graphically shown in the two accompanying charts. Chart 1 shows the reductions in the numbers killed. The heavy line indicates the numbers killed each year from all causes; the light line shows the numbers of deaths each year from lockjaw. Chart 2 shows the totals of those killed and injured for the fourteen years. Note that in spite of the publication annually of the awful results of the celebration, the totals continued gradually to increase until 1908, and that the remarkable decrease began in 1909.

THE SPREAD OF THE CAMPAIGN

In 1908 another table (Table 8) was added to THE JOURNAL'S statistics, in which the numbers killed and injured in each of the eighty-four largest cities were shown. It was also pointed out—a fact—that the responsibility for these casualties clearly rested with city governments. When the 1908 report was published, reprints were circulated far and wide among newspapers and other publications. The result was most remarkable. Since that time not only did the press of the country generally take up the cause, but also local, state and national organizations and societies became interested. They not only argued against the use of fireworks, but, more important, also provided more rational and patriotic means of celebration. Vigorous action was taken by city councils, and each year the ordinances are growing more prohibitive. All these forces have made most liberal use of THE JOURNAL'S statistics, even though the source has not always been mentioned. The number of deaths has been reduced from 215 to thirty; the

CHART 2.—TOTAL CASUALTIES FROM FIREWORKS

The dark line shows the annual fluctuation in the total number of Fourth of July injuries since 1903.



Year	1903	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16
Totals	4,449	4,109	5,176	5,466	4,413	5,023	5,307	2,923	1,603	988	1,163	1,500	1,165	850

deaths from lockjaw from 125 to none, and the totals of deaths and injuries from 5,460 to 850.

The matter is now well in hand, and the annual returns are comparatively insignificant. Nevertheless, 850 casualties and thirty deaths are too heavy a price to pay for a continuance of the old-time and out-of-date form of celebration. It is time that the more modern "safe and sane" methods should prevail.

TABLE 8.—NUMBER REPORTED KILLED AND INJURED IN THE LARGER CITIES DURING TEN YEARS

Marginal No.	City	1907		1908		1909		1910		1911		1912		1913		1914		1915		1916		Totals		Marginal No.
		Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	
1	New York City	22	422	11	316	7	559	6	179	2	91	1	58	..	65	1	94	..	272	1	79	52	2,135	1
2	Chicago	16	151	12	202	..	118	4	62	2	53	2	12	1	12	3	18	5	3	1	8	46	639	2
3	Philadelphia	7	248	6	426	9	508	4	405	..	294	2	127	3	340	4	237	1	280	1	73	37	2,988	3
4	St. Louis	3	189	4	229	4	163	..	44	..	38	..	48	..	72	1	43	..	47	..	37	12	930	4
5	Boston	3	59	6	190	5	167	..	35	..	3	..	16	1	15	..	12	..	27	..	21	15	540	5
6	Cleveland	3	63	12	93	..	4	..	1	..	5	..	1	..	4	..	1	..	..	..	1	15	173	6
7	Baltimore	..	5	1	10	..	5	..	6	..	10	..	10	1	12	..	6	..	19	..	12	2	95	7
8	Pittsburgh	10	88	..	30	5	48	6	28	1	25	1	14	1	46	1	11	..	8	..	17	25	313	8
9	Detroit	2	46	..	10	2	46	1	17	..	18	2	20	1	2	..	6	2	14	..	10	223	9	
10	Buffalo	..	18	2	11	..	33	1	13	..	16	..	6	..	16	2	9	..	1	..	7	6	130	10
11	San Francisco	..	....	..	11	..	12	..	9	1	8	..	7	..	9	..	4	..	5	..	9	1	74	11
12	Milwaukee	2	63	..	70	..	78	3	112	1	19	..	24	..	10	..	8	..	9	..	14	6	437	12
13	Cincinnati	2	89	1	112	3	80	3	49	1	4	..	21	..	26	1	4	2	1	..	4	13	306	13
14	Newark, N. J.	1	129	2	91	1	150	1	15	..	....	..	....	..	....	..	2	1	1	..	....	6	389	14
15	New Orleans	..	8	..	4	..	....	..	3	..	2	..	2	..	3	..	4	..	....	..	7	..	33	15
16	Washington, D. C.	..	12	..	21	..	....	..	....	..	....	..	2	..	1	..	1	..	1	..	....	..	38	16
17	Los Angeles, Calif.	..	35	..	40	..	26	..	....	..	4	..	5	..	6	..	1	..	7	..	7	..	131	17
18	Minneapolis, Minn.	..	13	..	10	1	24	..	20	..	....	..	3	..	2	..	1	..	1	..	....	..	71	18
19	Jersey City, N. J.	..	31	5	34	1	14	1	44	..	14	..	....	..	....	..	....	..	3	..	3	..	146	19
20	Kansas City, Mo.	1	46	..	55	4	67	1	25	..	4	..	1	..	....	..	....	1	....	..	....	7	198	20
21	Seattle, Wash.	1	3	..	1	3	10	..	7	..	....	..	2	..	2	..	1	..	....	..	....	4	26	21
22	Indianapolis, Ind.	1	31	1	14	1	35	..	24	1	5	..	6	..	1	..	11	..	10	..	3	5	137	22
23	Providence, R. I.	..	20	1	21	..	13	..	10	1	9	..	2	2	17	..	7	..	1	..	3	1	105	23
24	Louisville, Ky.	..	13	..	10	1	10	1	13	..	3	..	2	..	2	..	8	..	3	..	....	2	64	24
25	Rochester, N. Y.	..	12	..	10	..	5	..	10	..	4	..	2	..	4	..	8	..	....	..	6	..	61	25
26	St. Paul, Minn.	..	20	..	13	..	18	..	12	..	10	..	7	..	2	..	4	..	4	..	3	..	93	26
27	Denver, Colo.	..	8	..	13	..	12	1	6	..	2	..	7	..	1	..	1	..	....	..	....	..	51	27
28	Portland, Ore.	..	2	..	3	..	16	..	13	..	1	..	2	..	....	..	....	..	....	1	2	1	39	28
29	Columbus, Ohio	5	36	..	5	1	19	..	....	..	1	..	1	..	2	..	....	..	1	..	....	6	65	29
30	Toledo, Ohio	1	5	..	8	2	3	1	2	..	2	1	1	..	7	..	....	1	1	1	6	29	30	
31	Atlanta, Ga.	1	4	..	3	..	....	..	5	..	10	..	28	..	4	..	....	..	....	..	1	1	54	31
32	Oakland, Calif.	..	9	..	3	..	....	..	9	..	1	..	2	..	4	..	....	..	3	..	....	..	32	32
33	Worcester, Mass.	1	6	2	20	1	42	..	6	..	1	..	10	..	14	..	3	..	13	2	13	6	128	33
34	Syracuse, N. Y.	..	20	..	14	..	13	..	6	..	1	..	4	..	15	..	6	..	....	..	10	..	89	34
35	New Haven, Conn.	..	2	..	....	..	15	..	....	..	1	..	6	..	10	..	11	..	....	..	1	..	46	35
36	Birmingham, Ala.	..	....	..	....	..	....	..	....	..	3	..	....	..	....	..	....	..	....	..	....	..	3	36
37	Memphis, Tenn.	..	1	..	3	..	4	..	2	..	....	..	2	..	1	..	....	..	....	..	....	..	13	37
38	Scranton, Pa.	..	5	1	17	1	29	..	6	..	10	..	....	..	9	1	15	..	4	..	9	3	104	38
39	Richmond, Va.	..	....	..	....	1	1	..	....	..	....	..	....	..	....	..	4	..	....	..	....	1	5	39
40	Paterson, N. J.	1	29	2	31	1	45	1	14	..	5	..	2	..	4	..	....	..	....	..	1	5	131	40
41	Omaha, Neb.	..	25	..	10	1	17	..	17	..	7	1	2	..	16	..	6	..	1	..	4	2	105	41
42	Fall River, Mass.	..	....	..	12	..	19	..	1	..	....	..	1	..	....	..	1	..	....	..	....	..	37	42
43	Dayton, Ohio	..	11	..	14	..	4	..	2	..	4	..	9	..	12	..	2	..	8	1	....	3	108	43
44	Grand Rapids, Mich.	..	20	1	30	..	2	..	17	1	6	..	10	..	2	..	....	..	....	..	....	..	34	44
45	Nashville, Tenn.	..	2	..	....	..	....	..	8	..	2	1	....	..	....	..	....	..	....	1	....	2	13	45
46	Lowell, Mass.	..	23	..	....	..	18	..	....	1	3	..	....	..	....	..	4	..	2	..	2	..	29	46
47	Cambridge, Mass.	..	....	..	17	..	....	..	....	..	4	..	4	..	8	..	2	..	4	..	2	..	27	47
48	Spokane, Wash.	..	....	..	....	..	....	..	....	..	7	..	1	..	3	..	23	..	3	1	12	1	50	48
49	Bridgeport, Conn.	..	1	..	27	..	21	..	4	..	4	..	....	..	1	..	....	..	3	..	....	..	116	49
50	Albany, N. Y.	1	24	..	37	..	31	..	11	1	5	..	9	..	27	..	3	..	27	..	33	..	161	50
51	Hartford, Conn.	..	18	..	18	..	11	..	14	..	1	..	....	..	1	..	....	..	....	1	2	1	117	51
52	Trenton, N. J.	..	38	1	17	1	58	..	....	..	1	..	....	..	....	..	1	..	....	..	....	1	5	52
53	New Bedford, Mass.	..	....	..	3	..	....	..	....	..	....	..	3	..	21	..	5	..	....	1	13	2	96	53
54	Reading, Pa.	..	17	..	13	..	17	1	3	..	4	..	1	..	....	..	2	..	....	..	....	..	35	54
55	San Antonio, Tex.	..	....	..	1	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	1	55
56	Camden, N. J.	..	16	..	29	4	14	..	6	..	....	1	....	..	....	..	1	..	2	..	6	5	74	56
57	Salt Lake City	..	15	..	6	2	14	1	4	..	....	..	1	..	....	..	....	..	....	..	1	3	47	57
58	Lynn, Mass.	..	3	..	11	3	16	4	..	..	....	..	2	..	1	..	....	..	....	..	1	3	41	58
59	Springfield, Mass.	..	21	1	36	1	9	1	2	..	4	..	....	..	1	1	....	..	1	..	3	4	77	59
60	Wilmington, Del.	1	14	..	13	3	9	..	6	..	3	..	5	..	6	..	6	..	1	..	2	4	65	60
61	Des Moines, Iowa	1	21	..	41	..	13	..	23	..	12	..	....	..	6	..	6	..	4	..	....	1	126	61
62	Lawrence, Mass.	..	11	1	5	..	22	..	....	..	....	..	....	..	....	..	....	..	....	..	....	1	39	62
63	Tacoma, Wash.	2	4	1	3	..	3	..	2	..	....	..	1	..	....	1	....	..	....	..	1	4	14	63
64	Kansas City, Kan.	1	10	..	17	..	33	..	14	1	5	..	....	..	....	..	....	..	....	..	....	2	79	64
65	Yonkers, N. Y.	..	32	..	5	..	8	..	....	..	4	..	....	..	....	..	....	..	....	..	3	..	52	65
66	Houston, Tex.	..	....	..	1	..	1	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	2	66
67	Duluth, Minn.	..	13	..	9	2	10	..	3	..	1	..	....	..	....	1	1	..	....	..	....	3	37	67
68	St. Joseph, Mo.	1	23	1	41	1	24	..	11	..	1	..	....	..	3	..	....	..	....	..	....	3	103	68
69	Somerville, Mass.	..	....	..	....	..	1	..	2	..	....	..	1	..	....	..	1	..	....	..	....	..	5	69
70	Troy, N. Y.	..	2	2	18	..	16	1	8	..	2	..	1	..	1	..	6	..	....	..	....	3	52	70
71	Utica, N. Y.	..	18	..	10	..	5	..	7	..	....	..	....	..	2	..	1	..	1	..	....	1	38	71
72	Waterbury, Conn.	2	8	..	14	..	5	..	15	1	....	..	....	..	1	..	....	..	1	..	8	4	51	72
73	Schenectady, N. Y.	..	4	..	20	..	8	..	13	..	7	..	....	..	1	..	2	..	....	..	1	1	56	73
74	Hoboken, N. J.	..	1	1	24	..	7	..	4	..	....	..	1	..	....	..	....	..	1	..	1	1	39	74
75	Elizabeth, N. J.	..	43	..	72	..	37	..	15	..	1	..	....	..	....	..	....	..	....	..	....	..	168	75
76	Manchester, N. H.	..	3	..	1	1	5	..	....	..	....	..	1	..	1	..	2	..	....	..	....	1	13	76
77	Evansville, Ind.	..	5	..	12	..	6	..	7	..	1	..	....	..	....	..	9	..	2	..	....	..	42	77
78	Norfolk, Va.	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	1	..	....	..	....	..	1	78
79	Wilkes-Barre, Pa.	1	..	2	38	1	15	2	5	..	2	..	5	..	1	..	3	..	11	..	20	7	109	79
80	Peoria, Ill.	..	8	..	27	1	22	1	17	..	....	..	2	..	....	1	3	..	....	..	....	3	79	80
81	Erie, Pa.	..	....	..	1	..	4	..	2	..	3	..	1	..	1	..	3	..	1	..	....	..	16	81
82	Savannah, Ga.	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	82
83	Harrisburg, Pa.	..	23	1	71	..	22	..	8	..	1	..	....	..	....	..	....	..	7	..	....	1	128	83
84	Portland, Me.	1	2	..	....	..	2	..	....	1	2	..	....	..	1	..	1	..	1	..	....	2	9	84
	Totals	94	2,458	83	2,800	80	2,936	43	1,457	16	774	12	522	10	854	18	681	10	806	15	378	381	13,736	
	Totals elsewhere	70	1,791	80	2,600	135	2,155	88	1,335	41	772	29	423	22	309	22	825	20	359	15	472	522	11,042	
	Grand totals	164	4,249	163	5,400	215	5,091	131	2,792	57	1,546	41	945	32	1,163	40	1,506	30	1,165	30	850	903	24,768	

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SATURDAY, AUGUST 26, 1916

FOOD ECONOMICS

The great European conflict has focused attention on problems of food supply and nutrition in ways which would long have remained unconsidered during the less critical conditions of peace. The impending necessity of complete self-sufficiency in matters of food supply early compelled Germany to give serious consideration to the situation and to take an inventory of the national food reserves. But this was not all. It led to a serious scientific study of the requirements of a nation in order that the attempts to meet them might be undertaken on a rational basis. With the minimum needs clearly ascertained, the distribution of food could be marshaled so as to prevent distress and promote physiologic efficiency. This was the significance of the Eltzbacher[1] monograph, compiled by Germany's foremost students of nutrition, including Zuntz, Rubner, Oppenheimer and Lehmann. The problem of feeding a nation was not left solely to the statistical compilations of economists. A strong team of physiologic experts was engaged, and their advice was of the greatest help in the hour of national exigency. Countries in which highly educated men are slightly esteemed, Lusk writes, would have passed over such advice, "consigning it to the newspaper dunghill of 'highbrow' information, and starved to death in consequence."[2]

There are some lessons from the newly acquired European data which are worth reciting in our own country. The estimated actual annual food requirements of 68,000,000 people in Germany are placed at over 56,000,000,000 calories, including 1,605 thousand metric tons of protein.[3] The lowest wholesale cost of such a yearly food supply is stupendous, reaching figures aggregating billions of dollars. It is not difficult, with the statistics now available, to convert some of these estimates into figures applicable to American conditions. Assuming a monthly expenditure of $25 per family of five persons — surely a conservative estimate for these days, even among persons of very limited earnings — if the 100,000,000 inhabitants of the United States lived as the typical poor man's family just cited lived, the cost of food would aggregate $6,000,000,000 a year. Furthermore, the expenditure reckoned on the basis of a more liberal allowance for food of greater variety and quality would be far larger. Gephart, of the Russell Sage Institute of Pathology, New York, has ascertained the cost of food in a large boarding school in this country to average 13.8 cents a thousand calories. Such a dietary, if taken by the inhabitants of the United States, would cost twice what the other allowance totals.

A family of five, consisting of two adults and three children, may reasonably be assumed to require between 11,000 and 12,000 calories of food a day. About half of this may be made up of the staples, bread, butter, milk and sugar. In the retail stores of the poorer districts in our large cities this portion of the allowance, say 6,000 calories, can be purchased for 40 cents, at an average cost of somewhat more than 6 cents a thousand calories, instead of nearly 14 cents, the average cost for the school quoted above. If $25 is spent each month for food, 80 cents a day are available, or only about 7 cents for a thousand calories. With such narrow margins between food costs and available income among the less well-to-do classes, not to say the poorest classes, how helpful it would be to promote the information that fundamentally good nutrition can be obtained at a reasonable cost in the form of the staples referred to, so that the expenditures for meats and the less common food products could be acquired in accord with incomes, and inessentials omitted without sacrifice of health.

The annual consumption of sucrose has reached 85.4 pounds per capita in the United States, a quantity equivalent to 2,000 calories daily for a family of five. Lusk remarks that this quantity of sugar costs the nation a million and a half dollars daily, and the rich harvest to be reaped by the substitution, for only a part of this, of saccharin, which has no food fuel value whatever, is obvious. Recalling the billions annually spent for food in the United States, Lusk illuminatingly adds that to any man of large affairs the maintenance at Boston of the Nutrition Laboratory of the Carnegie Institution of Washington, with its budget of $60,000 per annum, appeals impressively to the imagination; yet this work is accomplished at an annual expense of a thousandth of 1 per cent. of what the American people would pay for food if each family of five had an income of $720 per annum. Is it not a little sad, he asks, to think that the expenditure of thousands of millions of dollars annually for food, an expenditure amounting frequently to more than half the income of the poor man, should take place without any real idea as to the nature of foods?

1. Eltzbacher, P.: Die Deutsche Volksernährung, Brunswick, 1914.
2. Lusk, Graham: Food Economics, Jour. Washington Acad. Sc., 1916, vi, 387.
3. These and many other statistical facts here referred to are taken from the summary by Lusk in an address delivered before the Washington Academy of Sciences, April 14, 1916 (Jour. Washington Acad. Sc., June 19, 1916).

THE PASTEURIZATION OF MILK

The recent outbreak, in an Eastern city, of an epidemic of infectious sore throat, directly traceable to a single milk supply, has again brought up the question of the pasteurization of milk offered for public sale. A prominent New York daily newspaper repeats in its editorial columns the often reiterated advice, "Drink no raw milk"; the state board of health, in whose jurisdiction the epidemic occurred, is scored because it does not profit by experience and enact an ordinance permanently enforcing pasteurization of all milk sold in that state, inasmuch as the impossibility of protection by dairy inspection alone is established.

This sort of publicity directs attention anew to the claims of the advocates of pasteurization. The bacteriologist of the Dairy Division of the federal Bureau of Animal Industry has tersely reviewed the present status of the subject in a government bulletin which will be of interest to health officers and medical men as well as dairymen.[1] This may be taken as an unbiased, if not a "neutral" summary of the situation. It is contended that from a sanitary standpoint the value of pasteurization is of the greatest importance when market milk is under consideration; for when the process is properly performed it affords protection from such pathogenic bacteria as *Bacillus tuberculosis, B. typhi, B. diphtheriae,* and the dysentery bacillus — and probably from many others, such as the organisms of foot-and-mouth disease, epidemic sore throat, and scarlet fever, which have at times been traced to milk.

The milk industry, however, has to meet problems of profitable production as well as hygienic requirements. Pasteurization is of value from a commercial standpoint so far as it increases the keeping quality of the milk and prevents financial losses by souring. It is today the most available process for the destruction of bacteria in milk on a commercial scale. As practiced at the present time — heating to 145 F., and holding at that temperature for thirty minutes, followed by rapid cooling — with reasonable care, pasteurization destroys about 99 per cent. of the bacteria; and while it does not prevent the ultimate souring of milk, it does delay the process. It can scarcely be an unjustified "fad" that the general tendency in this country today is toward the pasteurization of all market milk, with the exception of certified and inspected milk from tuberculin-tested herds. In seven of the very large cities in the United States for which statistics were obtained, Ayers found that far more than 50 per cent. of the total milk supply was being pasteurized. This result is the outcome of investigation and propaganda of less than a dozen years' duration. In the smaller cities the process is far less widely employed, possibly because the safeguarding of the milk supply is a less difficult problem in them. We doubt, however, whether the dangers are sufficiently realized in the smaller communities. If, as has been estimated, 127,000 people are engaged daily in handling the milk supply of New York City, it is likely that a city of only 50,000 or even less would require a system of inspection of a magnitude quite out of proportion to most of the disadvantages of pasteurization, in order to guarantee a safe milk supply. Speaking from a national standpoint, the need of education at present seems to lie not so much in the great centers of population where expert advice and control is being more freely and effectively employed each succeeding year, but rather in the smaller cities. The only valid objections to pasteurization, if indeed they are sufficiently tenable to be serious, come from the pediatricians who look with fear on a possible damage to the milk in point of digestibility or liability to the production of infantile scurvy. These dangers are now avertable. It must never be forgotten, however, that the infant is not the only person whose welfare is concerned in relation to the consumption of milk. "For economic reasons, and in recognition of the process as a means of eliminating certain risks which cannot be completely eliminated in any other way, the pasteurization of milk is certain to be the general practice in this country."

1. Ayers, S. H.: The Present Status of the Pasteurization of Milk, Bull. 342 (Professional Paper), U. S. Dept. Agric., Washington, 1916, from which many of the statements above are taken directly.

A SAFE AND SANE FOURTH

In 1903 THE JOURNAL began the collection of statistics regarding deaths and injuries resulting from the use of fireworks in the celebration of the Fourth of July, and for fourteen years has fought for a betterment of conditions. In addition to securing data through news-clipping bureaus, blanks were sent to physicians, health officers and hospitals, requesting lists of casualties. From the beginning special efforts were made to obtain information as to cases of tetanus resulting from these injuries. The tabulated figures of injuries and the enormous proportion of deaths from lockjaw in that first year were appalling. In the 1903 report it was shown that 4,449 persons had been injured, and that 466 had died. Of those injured, many had lost their sight, had legs, arms or hands blown off, or were otherwise mutilated for life. Of those fatally injured, 406, mostly children, died from tetanus, or lockjaw. In the report particular attention was called to the fact that the great majority of lockjaw cases had resulted from blank cartridge injuries, and prohibition of their use was urged. Special directions were also given regarding the care of all blank cartridge and other puncture wounds, and the early use of tetanus antitoxin as a prophylactic was strongly advocated. Reprints of the report were circulated, but not to so great an extent as was done a few years later.

In the following year a gratifying improvement was noted in the reduction of deaths from tetanus —ninety-one instead of 406. Little or no attention was at first paid to the statistics. In spite of the annual publication of the awful results year after year, the number of casualties continued to increase, until in 1908 there were 5,623 accidents, and in 1909 there were 215 deaths, 125 of which were from lockjaw.

In 1908, however, in addition to the statistics previously presented, a table was prepared, giving the casualties in eighty-four of the largest cities. This showed that the majority of deaths and injuries were clearly due to the lawlessness and disorder permitted in these cities. The corollary was also clear that the city governments were responsible, since the annual carnage could be prevented only by restrictive ordinances. The pamphlet containing a reprint of the report of 1908 was sent to newspapers throughout the country. The response was remarkable. The press generally quoted THE JOURNAL'S statistics, naturally emphasizing the figures for the local city and state. The facts touched local pride. Civic and other organizations started campaigns for the suppression of fireworks and the encouragement of a more enlightened celebration. City officials were stimulated to action, and in a single year a remarkable diminution of injuries resulted. That progress, with slight fluctuations, has continued, until this year not a single case of lockjaw resulted from the celebration, and there were less than one-fifth as many injuries as were reported in 1903.

It was a foregone conclusion that, once the public was acquainted with the facts, a change would be demanded. It is apparent that "a safe and sane" celebration of our independence will soon become so widespread that there will be neither injuries nor deaths from this needless cause.

THE BEHAVIOR OF PHAGOCYTES

In an address to the students of the University of Amsterdam several years ago, Metchnikoff, to whom we owe the fundamental contributions to our knowledge of the relation of phagocytes to disease, remarked:

> We are only at the beginning. When the physiology of the phagocytes is better understood, methods will be sought to promote the activity of these elements in the fight against microbes, and efforts will be made to protect important cells of the body against phagocytic attack.[1]

In these days, when the scientific labors and fascinating theories of this recently deceased biologist are being discussed in popular as well as in professional journals, it may be fitting to refer to some of the more recent contributions to the knowledge of the phagocytes. Among them an unusual interest is attached to the investigations at the University of Groningen under the leadership of Hamburger.[2]

In continuance of his studies on the effect of salt solutions on various compositions, quantitatively and qualitatively, on the red corpuscles of the blood—studies which served in large measure to introduce physical chemistry into the medical sciences—Hamburger and his collaborators have found that the white cells are likewise subject to chemical and volumetric changes. The behavior of phagocytes early engaged their attention, primarily from a purely scientific standpoint; yet many of the discoveries made have an immediate practical significance in relation to bodily welfare and therapeutic procedure. The simplest method of investigation has been to transfer the leukocytes to various mediums mixed with very small particles of carbon. Under suitable conditions many of these phagocytic cells promptly engulf the foreign particles as they do bacteria. The number of cells which take them up in a given period depends on the composition of the mediums, some stimulating and others exhibiting detrimental effects. The addition of surprisingly small quantities of acid or salts or other compounds of varied character is frequently very conspicuous in its influence on the intensity of phagocytosis. Another plan has been to place under the skin of experimental animals small capillary tubes closed at one end and filled with an extract of bacteria in a solution of sodium chlorid. The chemotactic influence of the contents induces phagocytes to enter these tubes. The mobility of the cells, and consequently the numbers which migrate, are influenced by the composition of the mediums—in this case the tissue fluids.

Hamburger has found that very small quantities of calcium salts increase phagocytic power to a considerable extent not only in the test tube, but also in the body. The introduction of small quantities, such as are present in some natural mineral waters, by rectum has been found to promote the motility and chemotaxis of phagocytes. The immediate application of this will at once suggest itself. Taking it for granted, says Hamburger, that phagocytosis plays a part in the defense against microbes, we may infer from the foregoing that an enrichment of our blood, and through this also of the tissue fluids, with small amounts of calcium, must have a favorable effect on local and other infections.

Supporting evidences are not wanting. The salts of calcium have been employed with alleged favorable effects in pneumonia, though Lauder Brunton, who championed this therapy, did so on quite different grounds. It is said that workers in lime kilns rarely acquire tuberculosis; and in Holland such laborers

1. "Nous ne sommes qu'au début. Lorsqu'on connaitra mieux la physiologie des phagocytes, on cherchera des méthodes pour augmenter l'activité de ces éléments dans la lutte contre les microbes, et on cherchera d'autres pour préserver contre l'attaque des phagocytes les cellules nobles de notre corps."

2. Hamburger, H. J.: Physikalisch-chemische Untersuchungen über Phagozyten: Ihre Bedeutung vom allgemein biologischen und pathologischen Gesichtspunkt, Wiesbaden, 1912, Verlag von J. F. Bergmann; also articles in the Proceedings Roy. Soc. Netherlands (Amsterdam); Researches on Phagocytosis, British Med Jour., Jan. 8, 1916.

cover wounds with lime. Iodoform in suitable concentration also promotes phagocytosis, so that Hamburger has ascribed any favorable influence the drug may have in the treatment of wounds and chronic inflammations to its phagocytic rather than any antiseptic virtues. Similarly numerous other substances — benzene, camphor, turpentine, alcohol, chloral, fatty acids, and balsam of Peru — all applied in very small doses, showed a stimulating effect on phagocytosis, but paralyzed when given in greater concentration. These substances are soluble in fats; hence the hypothesis that slight quantities of them, dissolving in the outer layer of the cell, weaken it and increase its plasticity, whereas, as soon as greater quantities enter the cell, the detrimental effect becomes manifest. Hamburger would thus explain the beneficial effect of turpentine in the treatment of bacterial invasions of the lung and udder in cattle. In the same way, he adds, we can explain the marked effect of camphor treatment in inflammatory processes of the uterus and its adnexa — an effect not understood heretofore. There is, further, the great effect of covering wounds with balsam of Peru and the supposed therapeutic value of inhalations of turpentine vapor in infectious processes of the respiratory organs. It is even not unlikely that the stimulating action which comes into play on phagocytes may also promote the activity of other cells (granulation cells) which take a part in healing processes.

It would lead us too far afield to follow the Groningen school into further fascinating and suggestive hypotheses relative to the behavior of phagocytes under influence of a changed environment. Worthy of mention, however, is the indication that like the respiratory center, these blood cells are readily stimulated by weak concentrations of carbon dioxid. We are reminded of the favorable effect of the therapeutic application of venous congestion, as in Bier's hyperemia procedure, in inflammatory processes of microbial nature. Here Hamburger believes that the increasing accumulation of carbon dioxid accelerates phagocytosis. Such are the random suggestions that follow from the pursuit of biologic science primarily for its own sake.

War Wounds of the Jaws.—The Germans realized from the opening of the war the necessity for systematic collaboration between the surgeon and the dental surgeon in treatment of gunshot and shell injuries of the face. They opened a special hospital for this class of cases, and soon increased the number of such institutions. The French were not long behind them, and it is reported that 1,000 dentists are at work in the medical corps of the army. They keep the soldiers' teeth in good condition and help in reconstructing mutilated jaws and mouths. About 500 are with the troops at the front and 500 in the hospitals in the interior. In England no attempt was made to concentrate such cases until July, 1915, and then only one hospital was set apart for them, but now more are being organized. An international gathering was held recently at London under the auspices of the British Dental Association to discuss treatment of war wounds of the jaws, and the necessity for the most skilful treatment available was emphasized anew.

Current Comment

THE PHARMACOLOGY OF NOVOCAIN

Many substitutes for cocain in local anesthesia have been introduced during the past twenty years. In most instances it was soon realized that the disadvantages of the new products outweighed the advantages, or that the newer drugs had only a limited field of usefulness. Novocain was introduced about twelve years ago with the claim that it was from one sixth to one tenth as toxic as cocain. It has been widely used by surgeons and dentists, who have been led to consider it harmless in ordinary doses. Investigators have called attention to an extraordinary dependence of the toxicity on the rate at which the drug enters the blood stream and the concentration of the solutions employed; nevertheless, it has been taught that the toxicity compared to that of cocain was of the order just stated. Hatcher and Eggleston[1] have recently shown that the toxicity of cocain varies widely with different individuals and with the rate of its absorption into the circulation, but that novocain shows far greater variations. There is an essential difference in that while an animal (cats were used mainly) once severely poisoned with cocain does not recover rapidly, the recovery from nonfatal doses of novocain injected intravenously is extraordinarily prompt. The animals frequently become apparently normal within a few minutes after the injection of doses of novocain that caused immediate stoppage of the heart and respiration. Slow and continuous injections of novocain in very large amounts also failed to produce lasting effects, even though the total amount used was ten times as great as that required by rapid injection to cause death. On the other hand, it was found that an animal under the influence of hydrated chloral, though not in any apparent danger from that drug, succumbed to one fourth of the average fatal dose of novocain for a normal animal. This suggests that the cause of death in those cases in which small doses resulted fatally in man lay in a hypersusceptibility of the heart or respiratory center. One animal under the influence of chloral hydrate succumbed to as little as 10 mg. of novocain per kilogram of weight, which corresponds to a dose of 10 grains for man. On the other hand, one of the animals survived a dose of 31 mg. of cocain per kilogram, which is more than three times the amount of novocain required to kill the chloralized animal and about three fourths of the normally fatal dose of that drug. It would seem inaccurate, therefore, to speak of the ratio of toxicity of the two drugs without reference to the mode of administration. This is further accentuated by the results of subcutaneous injections; when novocain is combined with epinephrin, absorption is slow and large doses are borne without permanent injury, but the effects are more prolonged than after the usual intravenous injections because the drug enters the circulation over a much longer period. Biologic tests of defibrinated blood to which novocain had been added showed that the drug

1. Hatcher and Eggleston: A Contribution to the Pharmacology of Novocain, Jour. Pharmacol. and Exper. Therap., July, 1916.

was not rendered inactive on standing for a short time. Solutions of novocain become almost inactive when perfused through the liver for an hour or more. The urine of a cat which had received an enormous dose of novocain — a total of 1,000 mg., corresponding to a dose of about 2 ounces for a man — by slow intravenous injection was inactive, showing that little or none of the novocain was excreted unchanged in the urine. The authors express the opinion that novocain has a distinct field of usefulness, but they call attention to the fact that death has followed the clinical use of small doses, and that toxic symptoms of varying degree of severity have been reported by numerous observers. Hence, while novocain is a valuable drug, it is not without its dangers, and the sooner these are understood and the better we are able to guard against them, the more useful the drug will be.

THE ETIOLOGY OF INFANTILE PARALYSIS—CHIROPRACTICALLY SPEAKING

Chiropractic, as THE JOURNAL has remarked before, is a freak offshoot from osteopathy—an illegitimate offspring of a plebeian cult of aristocratic aspirations. To the chiropractor all diseases are but manifestations of vertebral subluxations. Whether you suffer from soft corns or hardening of the liver the chiropractor finds the cause of your condition in your backbone. Through a somewhat skilfully managed press bureau the "science" and "art" of chiropractic has made a noise altogether disproportionate to its importance. A physician sends us a recent advertisement published in an Indiana country newspaper under the title, "Infantile Paralysis: What Is Said About It by the Chiropractors":

"Amid so much excitement that is uncertain as to the real cause of infantile paralysis, there is no mistaking the fact that there is a legitimate cause for the malady."

Here the chiropractic delivers a stinging rebuke to those misguided souls who believe the cause of acute poliomyelitis to be illegitimate! Continuing:

"This disease is caused by a vertebral subluxation, usually the atlas, but may be located any where in the spine which impinges either the spinal cord or nerves leading to it and thus produces inflammation of the anterior horns of the gray matter."

Could anything be simpler? Yes, the remedy! Should your child show symptoms of poliomyelitis—but let the chiropractors speak:

"If it is found they [children] are suffering from any spinal defect a competent Chiropractor should be called, for only through spinal adjustments can the fault be corrected. Restoration through Chiropractic adjustments is astonishingly rapid when given in the acute or early stages."

Aside from the smile that this example of the cock-sureness of ignorance may provoke there is a certain sardonic humor in this state of affairs. The public gives to individuals who have neither elementary education nor technical training the right to diagnose and treat human ailments. As a result quacks, charlatans and self-deluded ignoramuses take their toll of life and health—and the public pays the bill.

THE LOEWI REACTION FOR PANCREATIC DEFICIENCY

About ten years ago, Loewi of Graz described an interesting physiologic reaction which he proposed to apply in order to differentiate cases of diabetes with pancreatic involvement.[1] He observed that after extirpation of the pancreas in experimental animals the introduction of epinephrin into the conjunctival sac caused a dilation of the pupil — a phenomenon which does not occur in the normal animal. The conclusion was drawn that the removal of the pancreas had caused augmented irritability of the sympathetic system, which is concerned in these pupillary responses; hence it was assumed further that the pancreas normally has the function of inhibiting or depressing the sympathetics. The mydriatic effect of epinephrin applied to the eyes of patients supposed to be suffering from diabetes has been reported by several European observers, and is sometimes spoken of as the "Loewi reaction." Other investigators have reported a failure to obtain the effect described, under conditions of undoubted pancreatic impairment. It is a matter of considerable interest to learn in some more decisive way whether or not the pancreas has any specific relationship to the sympathetic nervous system. So much has been written of late about vagotonia that one quite naturally thinks of the possibilities of "sympathicotonia." An investigation by Hoskins and Gunning[2] at the Northwestern University Medical School on the irritability of the sympathetic motor neurons under a variety of conditions has failed to correlate them in any way with the pancreas. The belief that this organ exerts some subtle depressing influence on the sympathetic nervous system has little if any scientific evidence left to support it.

POLIOMYELITIS VS. OTHER INFECTIOUS DISEASES

Great catastrophes teach great lessons, and the greater the catastrophe the more impressive the lesson. Immediately after a disastrous railroad accident, a shipwreck or a sensational fire, in which lives are lost, action is always taken to safeguard the public against such particular incidents in the future. But a broad application of the lesson is seldom, if ever, made. The lesson of the Slocum fire, with its frightful loss of life, was applied only to safeguarding against a repetition of an identical occurrence in the future; the conditions which caused the disaster of the Eastland, for instance, were not anticipated. The sudden development of the present epidemic of poliomyelitis with its mortality and its train of crippled children has awakened special interest in this disease: all over the country boards of health are realizing their responsibility in regard to it. But it must not be forgotten that this particular epidemic is infinitesimal as compared, either in number or in total mortality, with the old enemies that are always with us. We are reminded of this by the *Survey*, which calls attention to the fact

1. Loewi, O.: Arch. f. exper. Path. u. Pharmakol., 1908, lix, 83.
2. Hoskins, R. G., and Gunning, R. E. L.: Pancreas Deficiency and Vasomotor Irritability, Am. Jour. Physiol., 1916, xli, 79.

that during May, June and July there were 3,205 cases of poliomyelitis in greater New York, while during the same period there were 9,710 cases of measles. The latter, like vice, is with us always, and we have become accustomed to it. And yet the total mortality over an extended period from this disease is far greater than that from poliomyelitis. Diphtheria, scarlet fever and the ever-present tuberculosis are today hardly given consideration; yet the total mortality from any of these diseases is infinitely greater than that from poliomyelitis, including epidemics. We are apt to forget that the latter disease is always with us, and that the present occurrence is merely a "flare-up," just as we have similar exacerbations of the other acute infectious diseases.

PROPHYLAXIS OF INFANTILE PARALYSIS

Early in June, it became apparent that New York, and particularly New York City and its environs, were about to undergo a siege with infantile paralysis. The defending forces, city and state health officers, were marshaled. Allied with them were many officers of the United States Public Health Service, private medical agencies and institutions. When the defenders began to outline a campaign, the fact became apparent that our knowledge of the mode of infection and the methods of transmission of poliomyelitis are not such as would warrant specific measures directed toward the elimination of the disease. Despite the excellent research that has been done, both laboratory and clinical, our knowledge, for practical purposes, is meager. We know something of the cause and the means of transmission, but on neither subject is our information even fairly complete. Perhaps twenty-five years from now, when these phases are understood, our present prophylactic efforts may appear to have been too troublesome, overstrenuous, or even ill advised. We shall recall them with the same feeling as that with which we recall the efforts of twenty-five years ago in connection with typhoid fever, yellow fever or malaria. In the light of our present general knowledge of infectious diseases, however, and of our modicum of information concerning poliomyelitis, the measures now being utilized are not only warranted but deserve the most rigid enforcement.

Gonorrheal Rheumatism

At the third annual meeting of the Scandinavian Dermatologic Association, held in June at Christiania, Rasch reported his experiences with 216 cases of gonorrheal rheumatism, nearly all in men. Prostitutes seem to be practically immune. In treatment he relied on large doses of the salicylates, fractioned, daily exercises, moist heat and light massage. The exercises are done by the patient himself. As a rule the moist heat applications immobilize enough. To ward off ankylosis, light massage should be applied as early as possible, for about twenty minutes a day. With this treatment recovery was usually complete with free use of the joints. Half the patients were dismissed as cured in less than two months, and only fourteen required over three months' treatment. Boas corroborated his statements as to the efficacy of treatment on these lines, which he has applied in large numbers of cases, with and without supplementary vaccine therapy. The results with the vaccine therapy were no better than in the cases without it.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALASKA

Government Health Work in Alaska.—With the aid of special appropriations granted by Congress during the past two years the Department of the Interior, through the Bureau of Education, has been able to make considerable progress in checking the ravages of disease among the natives of Alaska. The government has recently opened a well equipped hospital in Juneau for native patients and small hospitals are maintained at three other centers of native population. A number of physicians and nurses have been employed for service in hospitals and in maintaining sanitary conditions in native villages, and the teachers of the public schools in Alaska are supplied with medicines and medical books in order to enable them, in the absence of a physician, to treat minor ailments.

CALIFORNIA

Typhoid in Oil Fields.—About 100 cases of typhoid fever have been reported in Taft and Maricopa. Dr. Frank L. Kelly, Berkeley, and Sanitary Inspector Edward T. Ross of the state board of health, are in charge of the situation and twelve deputy health officers have been appointed to assist them in their work.

Campaign for New Hospital.—On August 14, a meeting was held on the roof garden of the San Diego Hotel in the interest of a new hospital for the city of San Diego. The Sisters of Mercy who have conducted St. Joseph's Sanitarium for twenty-six years have agreed to erect a new hospital on a new site on thoroughly modern lines. Dr. Paul Wegeforth, San Diego, is secretary of the campaign committee of the hospital.

ILLINOIS

Typhoid in Elgin.—On August 22 the typhoid cases in Elgin totaled thirty-one. Dr. A. L. Mann, city physician, reported that the source of the contagion had been discovered in the water used by employees in a large local manufacturing plant. Dr. E. S. Godfrey is making an examination for the state board of health.

Chicago

Estate of Dr. J. B. Murphy.—It is reported that the estate of Dr. John B. Murphy totaled $1,250,000, of which all but $250,000 is in realty.

New Base Hospital Forming.—A meeting was held, August 21, to form a base hospital unit, comprising the Augustana, St. Joseph's and St. Mary's hospitals. Thirty men from the staffs of the three hospitals attended the meeting. The complete staff will include forty-six physicians, fifty nurses and fifty Red Cross assistants. The institutions were represented by Drs. A. J. Ochsner, E. H. Ochsner, Austin A. Hayden, Charles McKenna, P. J. H. Farrell and S. R. Pietrowicz.

Committee Appointed to Investigate Infantile Paralysis.—The commissioner of health and Dr. A. Augustus O'Neill have appointed a committee to undertake research on infantile paralysis. The members are: Dr. M. Herzog, chairman, and Drs. K. Meyer, H. B. Thomas, A. Hoyne and A. K. Armstrong. Other physicians have been appointed as an advisory committee. At a preliminary meeting, it is stated, the committee outlined a plan of investigation, and agreed that the work should not proceed until sufficient funds are forthcoming.

MARYLAND

Personal.—Dr. William A. Frontz has been commissioned major in the medical corps of the British army and will sail at once to take up work with the Harvard unit.——Dr. H. H. Biedler, chief surgeon of the Biedler and Sellman Sanatorium, has almost recovered from an illness that confined him to bed at the sanatorium for several weeks.——Dr. E. B. Beasley has been sent to New York by the U. S. P. H. S., to aid in combating infantile paralysis.

Infantile Paralysis.—A second case of infantile paralysis has appeared among the colored population.——Mayor Preston has suggested the fitting of certain buildings owned by

the city as special hospitals for children with infantile paralysis. The city already owns a number of buildings that might be fitted up. Dr. Blake is to find out the cost of equipping them and providing a staff of physicians and nurses.——Mrs. William Bauernschmidt, president of the Child's Hospital School, offered the state board of health last week, said the managers were ready to turn the buildings over to the city and state with the understanding that they would defray the cost of transferring the children now there to the Union Protestant Infirmary, and also pay $833.33 per month toward the care and treatment of paralysis patients. Mrs. Bauernschmidt also said the city and state would be asked to pay for additional physicians and nurses.

MASSACHUSETTS

Infirmary Dedicated.—The new infirmary of the Medfield State Hospital was dedicated, August 3. The speakers included Lieutenant-Governor Coolidge, Dr. Edward H. French, superintendent of the hospital Dr. George O. Clark, Boston, and others.

Personal.—Dr. George M. Kline, superintendent of the Danvers Insane Hospital, has been appointed director of the Massachusetts Committee on Mental Diseases.——Dr. Charles G. Dewey, Dorchester, Boston, has also been appointed a member of the commission.——Dr. Lyman A. Jones, Swampscott, formerly district health officer, has been appointed chief of the division of hygiene of the state department of health, succeeding Prof. Selskar M. Gunn.

Diphtheria in Massachusetts General Hospital.—The Massachusetts General Hospital has been closed to new patients on account of the discovery of thirty cases of diphtheria among the nurses, physicians and ambulance drivers. Twenty-seven nurses, two physicians and one ambulance driver have been removed to the contagious department of the City Hospital and to a private hospital. The remaining employees and inmates have been examined and cultures have been taken, but no new cases have been discovered.

MICHIGAN

Health Board Annex Damaged by Fire.—The clinical laboratory of the Detroit Board of Health on Mullett Street was damaged to the extent of about $8,000 by a fire, August 3. The laboratory equipment and many records of the health department were destroyed.

Tuberculosis Survey.—The tuberculosis survey of the Upper Peninsula is about half completed. The remainder of the work will be done before September 16. During the second week in August, Flech, Iron Mountain and Norway were the towns under inspection and in these places tuberculosis clinics were held. Thus far twenty-five counties have been gone over by the state board of health tuberculosis survey.

Tuberculosis Day.—August 10 was celebrated in Michigan as Tuberculosis Day, under the auspices of the Committee on Tuberculosis of the Michigan State Medical Society. The governor issued a proclamation requesting physicians of the state to give their services free for the examination of patients supposed to be suffering from tuberculosis. Dr. Victor C. Vaughan, Ann Arbor, chairman of this committee, sent blanks throughout the state for the personal history and physical findings of those who applied for examination.

NEW YORK

Isolation Hospitals for Infantile Paralysis.—Westchester County has appropriated $30,000 for an isolation hospital at Eastview to care for cases of infantile paralysis in that county. On hearing of a case of infantile paralysis at Pocantico Hills, John D. Rockefeller has set aside a house on the outskirts of his property to be used as an isolation hospital.

Personal.—Mr. Elmer E. Rittenhouse has resigned the presidency of the Life Extension Institute to take a position with the Equitable Life Assurance Society.——Dr. Donald B. Armstrong has resigned as director of the department of social welfare of the New York Association for Improving the Condition of the Poor to become assistant secretary and director of the community tuberculosis experiment of the National Association for the Study and Prevention of Tuberculosis.

New York City

Two New Milk Stations.—During the lockout of the garment workers, last month, Nathan Strauss was induced to undertake to supply the strikers' babies in Brownsville and Williamsburg districts of Brooklyn with pasteurized milk. This need has now passed but the mothers in these districts have made an urgent plea that these stations be made permanent. If the demand warrants it these stations will be made permanent.

Infantile Paralysis.—Up to August 21 there were 7,200 cases with a total of 1,650 deaths. In the state outside of the greater city there have been, since last May, 1,239 cases, with a total of 150 deaths. The largest number of cases occurring outside of the city are in certain sections of Long Island, where the number of cases in proportion to the population is greater than in the city itself.—— A private citizen, whose name has not yet been made public, has given $2,000 and started a movement for a city wide canvass of all persons who have had infantile paralysis for the purpose of obtaining blood to increase the supply of serum. A committee has already obtained the names of some 700 persons who have had the disease and will send letters to them asking them to give blood. Those who are willing to do so will be asked to go to Willard Parker Hospital, where such a quantity as each individual can spare will be drawn.——A plan of follow-up work has also been matured which is designed to secure proper orthopedic treatment for paralyzed children after their recovery to which many prominent surgeons and philanthropic institutions are lending their cooperation.——The Brace Fund for which the department of health asked has now reached about $11,000, and it has been announced that Acting Mayor Dowling will introduce a resolution before the board of aldermen in September, asking the city to appropriate $20,000 for orthopedic appliances for the victims of poliomyelitis.——It has been definitely decided that the schools will not be opened until September 25, but pupils will be expected to report and register on September 6, 7 and 8. It is believed that no harm can come from this procedure as the board of education says the children will not be allowed to crowd together.——An appeal has been made by the laboratories of the department of health for animals, chiefly household pets, that have become paralyzed. The department wishes to use these animals for experimental purposes to determine whether they are sufferers from or "carriers" of infantile paralysis.——The advisory committee of the department of health has decided to begin a study of the condition of the tonsils and adenoids of children suffering from poliomyelitis to determine whether the enlargement or removal of these organs bears any relation to the disease.

The Control of Poliomyelitis.—The Department of Health of the City of New York has issued a circular of instructions to field workers regarding the procedures for the control of poliomyelitis. The incubation period of the disease and the quarantine period have been placed at fourteen days. In families where a case of poliomyelitis has occurred, all children under 16, excepting those who have had the disease, are to be quarantined for two weeks after the termination of the case. The patient must be quarantined for eight weeks from the onset of the disease; every house must be placarded and all placards dated. No case will be left at home unless a physician is in daily and regular attendance; unless the attendant of the patient obeys quarantine regulations and does no housework, marketing or other household duties; unless the patient and attendant have a separate room with the windows screened; unless there is a separate toilet for exclusive use of the family; unless quarantine regulations are strictly observed by the patient and other children in the family and unless the personal and bed linen of the patient are properly disinfected and after the completion of the case renovation of the premises is made. Inspectors must visit at once all cases reported by physicians, nurses, social workers and citizens; the janitor or his representative must be notified by the inspector that he will be held personally responsible by the department for keeping quarantined children in the family premises and seeing that placards are not removed; all cases of questionable diagnosis must be seen at once by the borough or chief diagnostician, and spinal puncture made whenever required, full history being recorded on a special card. Nurses must visit every case reported, to instruct the family regarding quarantine and every other family in the house that there is a case of the disease in the house that other children of the family will be quarantined and that should they fail to observe quarantine, steps will be taken to enforce quarantine by legal means if necessary. The nurse should also instruct regarding home cleanliness, personal hygiene, the danger of infection by flies and any general measures which may be taken to prevent infection and should also report to the branch office, without delay, any

suspicious illness of children or any case of poliomyelitis, especially not under the care of a physician; the nurse will also repeat the instructions given to the janitor or his representative by the instructor; nurses must visit patients remaining at home at least twice a week and oftener if necessary, and after the completion of the case they will issue renovation notices, following these up by visits until complied with. Sanitary police officers must visit frequently, daily if necessary, premises in which patients have been removed or remained, to enforce quarantine and to affix or replace placards; must serve summonses when quarantine regulations are broken and make the necessary appearance in court. Various social service organizations are making an intensive house-to-house survey in infected districts to instruct families verbally regarding the disease and its prevention by personal and domestic hygiene and to report illness, especially of children, and insanitary conditions. Visitors employed by three life insurance companies are also distributing literature and reporting illness and insanitary conditions. The physicians and nurses supplied by the Rockefeller Foundation, under the direction of the department of health, follow up the ramifications of all reported cases of poliomyelitis, make house-to-house inspection and report suspected cases.

NORTH CAROLINA

Sanatorium Opened.—The Anson Sanitarium, Wadesboro, was formally opened, July 4, with a surgical clinic participated in by a number of Charlotte surgeons and local men of the profession. A reception was held later and the community folk attended in large numbers. The local staff is composed of Drs. Robert D. Ross, Wadesboro; Edmund S. Ashe, Wadesboro; John E. Hart, Deepcreek; James M. Dunlap, Ansonville; Leonidas C. Smith, Polkton; T. A. Marshall and R. L. Hardison.

National Guard Medical Staff.—The medical staff of the North Carolina National Guard, lately mustered into the service of the United States, is as follows: major and chief surgeon, Baxter R. Hunter, Charlotte; majors, Henry I. Clark, Scotland Neck; James V. McGougan, Fayetteville; Abram R. Winston, Franklinton, and Francis J. Clemenger, Asheville; captains, Henry Norris, Rutherfordton; Reuben A. Campbell, Statesville; Armistead K. Taylor, Washington; Miles B. Abernethy, Reidsville; Hodge A. Newell, Louisburg; James W. Tankersley, Greensboro; William C. Horton, Raleigh, and Thomas F. Reynolds, Canton, and first lieutenants, Francis M. Davis, Canton; John H. Mease, Canton; Richard W. Spicer, Goldsboro; William B. Hunter, Wilmington; John W. MacConnel, Davidson; Benjamin M. Meriwether, Asheville; Honston B. Hiatt, High Point; T. B. Burress, Fairview; John E. Ray, Jr., Raleigh, and Raymond A. Pollock, Newbern.

OHIO

Hospital Site.—An ordinance has been prepared by the health department of Columbus authorizing the purchase of a 9-acre tract of land on Frebis Avenue, as a site for the new Isolation Hospital for which bonds of $25,000 were authorized at the election a year ago.

Appointments to Staff of Children's Hospital.—Dr. Leslie L. Bigelow has been appointed chief of staff of the new Children's Hospital in Columbus. Twenty other Columbus physicians, surgeons and dentists have received appointments. Eleven of those appointed are also members of the faculty of the College of Medicine and Dentistry of the Ohio State University.

New Laboratories.—The Youngstown Hospital has opened a newly equipped and enlarged department of pathology which has been placed under the charge of Dr. Charles C. Wolferth.——Dr. John G. Frey, city serologist of Cleveland, has established his headquarters in the laboratory adjoining the office of the health commissioner in the city hall, and has prepared to make free tests of blood.

Personal.—Drs. William R. Moore, Orland; Llewellyn G. Klepinger, Dayton, and Bernard R. LeRoy, Athens, have passed the Civil Service examination for fourth assistant physician for state institutions.——Dr. Samuel F. Paul has succeeded Dr. James C. M. Floyd, resigned, as a member of the board of health of Steubenville.——Dr. Louis L. Syman, Springfield, chief surgeon of the Detroit, Toledo and Ironton Railroad, will hereafter devote his entire time to the supervision of the medical department of the system, looking after not only the sanitary supervision of the road, but also the physical condition of the employees.——Sergts. Lemuel R. Brigman, Cleveland, and James H. West, Tiffin, of the Hospital Corps, Ohio National Guard, Columbus, have been commissioned first lieutenants, M. C., and assigned to the Eighth Infantry.——Dr. Clyde C. Roller has been appointed city physician of Akron.—Dr. Louis A. Thompson, National Military Home, Ohio, formerly chief surgeon of the Soldiers' Home, Johnson City, Tenn., has been transferred to a similar position in the central branch, National Military Home, Ohio. ——Dr. Emery R. Hayhurst, Columbus, has resigned as chief of the bureau of occupational diseases of the state department of health, to accept the assistant professorship of industrial hygiene in the Ohio State University. Dr. Roscoe P. Alhaugh succeeds Dr. Hayhurst as chief of the bureau of occupational diseases.——Dr. Edward Perkins Carter of Western Reserve University, Cleveland, has been given the honorary degree of Master of Arts by Williams College, Williamstown, Mass. ——Dr. Joseph H. Grossman, Cleveland, has been appointed lecturer on diagnosis of tuberculosis in the School for Applied Social Sciences of Western Reserve University.

OKLAHOMA

Ruling on Chiropractors.—The attorney-general is stated to have ruled that chiropractors must take the examination of the State Board of Medical Examiners if they are doing the work of osteopaths.

Personal.—Dr. Orange W. Starr has been appointed city physician of Drumright.——Dr. James L. Shuler, Durant, has opened a hospital in that place.——Dr. Albert S. Hagood, Durant, has been commissioned captain in the National Guard of Oklahoma and assigned to recruiting duty for the Reserve Battalion.

CANADA

Infantile Paralysis.—Infantile paralysis is on the increase in Ontario. Eight cases developed from August 1 to August 15. They are mostly in western Ontario. No deaths have been recorded during August. During the month of July there were eleven cases and two deaths; in June two cases and no deaths.——A number of Ottawa trained nurses who were recently turned back from the American border on account of being "contract labor," while enroute to help fight infantile paralysis in New York, have been admitted through a special order issued by Secretary McAdoo.——The medical officer of health at Kingston, Ont., is asking the Dominion government quarantine officers to increase precautions against the invasion of infantile paralysis from New York state.

Canadian Medical Association.—The Canadian Medical Association has not met in annual session since 1913. The 1914 meeting, which was to have been held in Vancouver, B. C., under the presidency of Dr. Robert E. McKechnie, Vancouver, was cancelled on account of the war; and so many of the officers and leading members are engaged on active service that it has been held inadvisable to continue the meetings. At a meeting, however, of the executive council held in Toronto in June, it was felt that the association was being injured by this action, and it was decided to renew the meetings in 1917 at some time and place selected by the executive. With so many members away the annual fees have diminished and an effort will be made to secure new members so as to return the association to its former good financial standing. During the absence of the secretary-treasurer, Dr. William W. Francis, Montreal, with McGill Base Hospital, the work of the association has been conducted gratuitously by Dr. J. W. Scane, registrar of the Medical Faculty of McGill University.

Personal.—Dr. J. H. Radford has been appointed medical officer of health at Galt, Ont., in succession to the late Dr. Thomas W. Vardon.——Dr. George C. Kidd, medical superindent of the Coburg Hospital for the Insane, has been transferred to the Brockville Hospital for the Insane, where he will be assistant superintendent.——The Military Cross has been conferred on Lieut. Peter McGibbon, C. A. M. C., Bracebridge, Alta.——Drs. Eric K. Clarke and F. F. Tisdale, house surgeons in the Toronto General Hospital, have joined the staff of a military hospital at Shorncliffe, England.——Dr. A. C. Delacroix, assistant resident physician at the Willard Parker Hospital, New York, has joined the staff of the Two Hundred and Thirty-Seventh American Legion Battalion at Halifax, N. S.——Capt. L. D. Collin, Winnipeg, Man., has been promoted to the head of the surgical department of the Laval University Hospital with the rank of major. That hospital is now stationed at St. Cloud, near Paris, France.——Capt. Victor McWilliams, Toronto, who has returned after a year's service at the front, has joined

the C. A. M. C. and is now on the staff of the training depot at Camp Borden.——Capt. Conrad G. Geggie, Quebec, has been appointed medical officer of the New Brunswick Highland Battalion. He went to the front with the first Canadian overseas force, and will be promoted to the rank of major. ——Capt. Edwin Douglas, Halifax, N. S., who has been medical officer to the fortieth battalion at the front, has been transferred to the staff of Dalhousie Military Hospital, now in France.——Col. Frederick W. Marlow, A. D. M. S., Toronto, has been appointed chief medical inspector of the C. E. F. and will travel from coast to coast inspecting and investigating medical arrangements.

GENERAL

Medical Reserve Officers Ordered to Duty.—Under special orders, No. 181, War Department, August 4, the following officers of the Medical Reserve Corps were ordered on active duty: Lieuts. Rudolph Matas, New Orleans; Isadore Dyer, New Orleans; Elijah H. Siter, Philadelphia; Frederic A. Washburn, Boston, and Elliott C. Cutler, Boston.

Bequests and Donations.—The following bequests and donations have recently been announced:

Dr. Emanuel M. Baruch, New York City, a bequest of $10,000, by Lina Matherny, a servant in the employ of Dr. Baruch for thirty years.

Medical Society of South Carolina, a bequest of $70,000 to be used to build either an annex to the present Riverside Infirmary Building, Charleston, or to enlarge and remodel the present building so that it may conform to the requirements of a modern hospital; St. Margaret's Home, Charleston, toward a new hospital at Park View, $10,000, by the will of Mrs. Rosa Thompson.

Physical Rejections.—The percentage of physical rejections after examination for muster into the United States service of the militia organizations of the states in the central department shows that the lowest percentage of physical disqualifications were in Iowa, 8 per cent. Illinois follows with 10 per cent.; then come Missouri, 12 per cent.; Minnesota, 13 per cent.; Michigan and Nebraska, each 15 per cent.; Kansas, 16 per cent.; Wisconsin, 17 per cent.; South Dakota, 18 per cent.; Indiana, 21 per cent., and Ohio, which is estimated at more than 30 per cent.

National Service School.—The work of the National Service School for Women at Lake Geneva, Wis., conducted under the direction of the Woman's Section of the Navy League, began August 14. During encampment the following lectures will be delivered: August 16, "Cancer and Other Malignancies," by Dr. Philip Schuyler Doane; August 18, "Woman's Place in War and Peace," by Dr. Ameen U. Fareed; August 21, "Aphasia," by Dr. Arthur Dean Bevan; August 23, "The Use of Roentgen-Ray Work in Time of War," by Dr. Dallas B. Phemister; August 25, "Sanitary Field Notes," by Col. William Stephenson, M. C., U. S. Army; August 28, "Base Hospital Work," by Dr. George G. Davis; August 28, "Efficient Women and National Preparedness," by John J. Halsey, and August 30, a subject unannounced by Dr. Frank Cary, all of Chicago.

Amendment to Treasury Decision on Narcotic Law.—Under date August 17, the Commissioner of Internal Revenue announces the following amendment to Treasury Decision 2292, as amended by Decision 2323:

In entering items calling for narcotic preparations on the order forms issued by the Commissioner of Internal Revenue, in accordance with the provisions of Section 2 of the Act of December 17, 1914, the quantity of narcotic drug to the fluid ounce, where put up in packages of fifteen ounces or less, shall be indicated in ounces, and where put up in packages containing sixteen ounces or more, may be entered in pints, quarts or gallons, provided the number of each, and not the aggregate quantity of these units in a higher unit, is entered on these order forms.

Where these order forms call for preparations or remedies in solid, powder, or other than liquid form, the quantity in ounces should be entered thereon, or if in tablet, pill, ampule or suppository form, the units or totals thereof need only be stated. The name of the particular narcotic drug in such preparations or remedies, tablets, pills, ampules or suppositories should be entered on these forms.

Appointments to the Navy.—Surg.-Gen. William C. Braisted, U. S. Navy, announces that the next examination for appointment in the Medical Corps of the Navy will be held on or about October 23 at Washington, D. C., Boston, New York, Philadelphia, Norfolk, Va., Charleston, S. C., Great Lakes (Chicago), Ill., Mare Island, Calif., and Puget Sound, Wash. The first stage of examination is for appointment as assistant surgeon in the Medical Reserve Corps, and embraces anatomy, physiology, materia medica and therapeutics, general medicine, general surgery and obstetrics. Successful candidates are then ordered to attend the Naval Medical School and during this time are on pay with allowances for quarters, heat and light, and at the end of the course, if successful in passing the examination, are commissioned assistant surgeons to fill vacancies. Full instructions may be obtained regarding these examinations by addressing the Surgeon-General of the Navy, Navy Department, Washington, D. C.

Medical Reserve Officers Discharged.—By direction of the president the following officers of the Medical Reserve Corps have been honorably discharged from the service of the United States, their services being no longer required: Lieuts. Gustavus I. Hogue, Milwaukee, Wis.; Charles A. Cattermole, Canon City, Colo.; Clarence E. Yount, Prescott, Ariz.; James F. Presnell, Chicago; Frank P. Williams, Boston; George A. Clotfelter, Hillsboro, Ill.; Howard A. Grube, Soldiers Home, Mich.; Fred A. Pittenger, Boise, Idaho; Henry W. Burnett, Providence, R. I.; Charles D. Center, Quincy, Ill.; Merlon A. Webber, Portland, Me.; Custis L. Hall, Boston; William J. Cranston, Augusta, Ga.; Frank H. Jackson, Houlton, Me.; Francis B. Johnson, Charleston, S. C.; Charles A. Speissegger, Jr., Charleston, S. C.; Gerald P. Lawrence, Columbus, Ohio; Gilbert E. Seaman, Milwaukee, Wis.; Luther H. Reichelderfer, Washington, D. C.; Allen J. Jervey, Charleston, S. C.; Harold M. Hayes, New York; Charles H. Parkes, Chicago; Homer S. Warren, Chicago; Eliot Bishop, Brooklyn; Leonard D. Frescoln, Philadelphia; William Marshall, Jr., Milford, Del.; Henry S. Satterlee, New York; Henry T. Byford, Chicago, and Bernard J. Beuker, Atwood, Mich.

Increased Interest in Red Cross.—The American Red Cross announces that during the six months ended July 21, its membership has increased from 27,000 to about 210,000, an increase of nearly 800 per cent. In the same time the number of Red Cross chapters organized throughout the country increased from 110 to 199. The personnel required for twenty-five base hospitals with 500 beds each for the army has been selected and enrolled from the staff of some of the best hospitals of the country, several naval base hospitals are now being organized, and funds for the purchase of equipment for sixteen of the army base hospitals, which cost $25,000 each, have been subscribed. In addition to this work the personnel required for two field columns for transferring sick and wounded from transfer hospitals to Red Cross base hospitals has been selected from the staff of two hospitals of the country and $10,000 has already been subscribed toward the equipment of one of these field columns. ——A mobile base hospital has been organized at Barnes Hospital, connected with Washington University, St. Louis, at the request of the American Red Cross. Dr. Fred T. Murphy is head director; Dr. Malvern B. Clopton, chief of the surgical service; Dr. Walter Fischel, chief medical officer; Dr. Eugene L. Opie, chief of laboratory work, and Miss Julia Stimson, head nurse.

Opportunities for Young Physicians in the Army Medical Corps.—By a recent ruling of the War Department the age limit for entrance to the Medical Corps of the Army has been raised from 30 to 32 years. Owing to the increase in the army which became effective, July 1, there are now 200 vacancies.

Not only is the age limit raised under the new conditions, but the opportunities for promotion are greatly increased. A study of the length of service of the officers of the Medical Corps promoted by the passage of the act increasing the size of the army shows that the junior captain promoted obtained his majority after only nine years in the service; the junior major was promoted to lieutenant-colonel after eighteen years in the corps and the junior lieutenant-colonel became a colonel twenty-seven years after he entered the corps. The sequence of nines in these promotions being accidental. The maximum pay for major is $4,000 a year, for a lieutenant-colonel $4,500 a year and for colonel $5,000 a year.

The Army Medical Corps offers an excellent field for the recent graduate. His position is permanent. From the outset his pay is $2,000 a year, with quarters or an allowance of $36 a month in lieu thereof; he is also given fuel and light or allowance therefor; when on government duty he receives liberal traveling expenses; he has also a leave allowance of one month per year on full pay. His income is not dependent on the caprice of patients. The government provides him with all incentives and facilities for study, books, instruments and appliances and encourages him in all ways to improve his opportunities. His pay increases 10 per cent. every quinquennium for twenty years, and when the time comes for his retirement, he receives three quarters of his pay for the remainder of his life.

Full particulars regarding admission to the Medical Corps of the Army and further information will be furnished by the Surgeon-General, U. S. Army, Washington, D. C., on application.

WAR NOTES

American College Men in Ambulance Corps.—Twenty graduates of American universities left Paris for the front, August 16, as members of the newly formed Section 9 of the American Ambulance field service.

Typhus Epidemic in Saloniki Region.—The *Scientific American* states that "a question frequently asked is why has not the allied army of 600,000 men at Saloniki joined in the general offensive of the Allies. A possible answer comes to us from a correspondent, who states that he has recently received a letter from London which states that the inactivity is due to the fact that typhus is epidemic in the entire territory into which these troops would be sent, and that until it was under control there would be no forward movement."

Red Cross Shipments to Foreign Countries.—The American Red Cross since between Sept. 7, 1914, and July 1, 1916, to the allied powers, has made 217 shipments consisting of 32,605 packages which include purchased supplies valued at $366,021.24 and donated supplies, designated, amounting to $408,908.68 and undesignated, amounting to $227,091.95, a total of $1,002,021.87. During the same period forty-eight shipments were made to the central powers consisting of 6,667 packages of which the purchased supplies were valued at $71,762.26; the designated donated supplies at $191,519.59 and the undesignated donated supplies at $47,450.51, making a total value of $310,732.36. In addition to these shipments, supplies valued at $110,875.75 were purchased by the American Red Cross and forwarded to France in three shipments. Fifty complete hospital tents were also purchased for the French Red Cross at a cost of $8,795 for which the American Red Cross received reimbursement. In addition to the listed supplies sent to the central powers there have been shipped by the American Red Cross to the Austrian Red Cross in Vienna, thirty-four cases of antitoxin valued at $131,986.50, and to the German Red Cross at Berlin, thirty-four cases valued at $229,595.60, which were paid for by the Austrian and German Red Cross societies, respectively.

Relief of Belgian Children.—The Rockefeller Foundation has recently received an appeal for the relief of about 500 children who have been living in the fighting zone in that part of Belgium which has not been occupied by the German forces. Arrangements had already been made and money subscribed for the removal of 760 children similarly situated, to the canton of Fribourg, Switzerland, where provision has been made for their protection, maintenance and education. The needs of the 500 additional children have overtaxed the resources of the hospitable Swiss and therefore, an appeal is made to America to contribute $73,000 for the first year which will cover the cost of caring for these 500 children. The Rockefeller Foundation on July 12 instructed the director of this War Relief Committee to authorize the removal of the children from Belgium, and the carrying out of the plan for their maintenance in Switzerland, and toward the necessary cost for the first year, the Belgian Relief Fund of New York City appropriated $25,000; the New England Belgian Relief Committee has appropriated $5,000 and has undertaken to secure an additional $5,000 and the Refugees' Relief Fund has appropriated $1,000 and agreed to furnish $500 a month. Further contributions may be sent to the Belgian Relief Fund, 10 Bridge Street, New York City, marked "Belgian Children Fund" or to the New England Belgian Relief Fund, 422 Boylston Street, Boston.

OUR TROOPS ON THE BORDER

Inspection of Feet.—Maj. William W. Reno, M. C., U. S. Army, Fort Bliss, Texas, has been detailed to inspect the feet of the 150,000 militiamen along the Mexican border.

Colored Glasses to be Provided for Soldiers.—The War Department has informed the American Red Cross that the quartermaster's department will make a gratuitous issue of colored glasses, or goggles, to the troops on the border for the protection of eyes from the glare and sand.

Base Hospital Enlarged.—The base hospital at Fort Bliss, Texas, which was recently enlarged to accommodate 500 patients, is being still further enlarged so as to double its capacity. The local Red Cross society has turned over all its supplies collected in the last three months to Lieut.-Col. Paul F. Straub, M. C., U. S. Army, for use of the men at this point.

Pennsylvania System Provides for Its Soldiers.—Dr. Busby of Philadelphia, accompanied by four other physicians of that city, representing the Pennsylvania System, held a conference in El Paso, July 24, with Gen. Charles H. Clement, commanding the Pennsylvania division, in regard to the needs of the militiamen who are employees of the Pennsylvania System and to plan for the distribution of a fund of $100,000 subscribed by the railway for the relief of the men and their dependent families.

PARIS LETTER

PARIS, July 27, 1916.

The War

AN ASSOCIATION OF SURGEONS AT THE FRONT

A body has just been organized with the title of Association des médecins du front. The intention is to group all those surgeons who have followed the campaigns of 1914, 1915 and 1916, whether they are still with the colors or in civil life. The seat of this association is at Bordeaux. It is strictly resolved to avoid all intervention, direct or indirect, with military authorities on behalf of its members who, having faithfully observed discipline and rules, expect nothing from favor. No speech or discussion on political or religious subjects will be permitted at the meetings. The objects of this association are (1) to multiply and strengthen the bonds of friendship and comradeship between the surgeons who have served at the front and to provide an opportunity for the manifestation of these sentiments after the war; (2) to draw up a list of comrades who have died for their country; to honor their memories and to offer to their families the condolences and support of the association; (3) to defend the interests common to all members of the group. During the hostilities the association will interest itself in questions of rent, taxes, insurance and replacement. After the war it will do what is possible to facilitate the reconstitution of their practices by negotiating with colleagues who have continued the exercise of medicine. It will assist the younger members to find employment, and it will bring pressure to bear on the authorities that official functions, as vaccination and inspection of assistant children, may be given preferably to those who have seen service, and that in various competitions those who have seen service may have advantages over those who have remained in civil life. Finally, the association will exert itself to help its members who have been mutilated in the course of the war.

VOCATIONAL REEDUCATION OF THE MUTILATED

In previous letters were mentioned the first foundations created for the vocational reeducation of the wounded and mutilated. Since then a great number of these schools have arisen, national, regional, departmental, communal or private; but, notwithstanding the considerable sums expended, the number of those who have been taught a remunerative trade and thereby rendered definitely capable to support themselves is really very small. When one inquires of these schools what are the figures relating to their results, the answer given by many of them is that only a few score of their pupils have received complete training. Some even do not go so far as ten; only seven or eight schools run into three figures. It is difficult to get the general total, but it is unlikely that it is more than a few thousand. The causes of this immense difference between the known wants and the results obtained are doubtless multiple; but in the front rank one is obliged to place the mentality of the pupil himself. Too generally he desires at most a little place, a small function and a modest situation. It is quite necessary to modify this state of mind. In the first place they must be clearly given to understand that they run no risk of a reduction of pension because of reeducation. An effort must be made to convince them that they are not definitely worthless and incapable. For this purpose, an energetic propaganda is necessary. The same difficulty has been felt in other countries, and this moral reeducation of the mutilated has been especially organized. The propaganda for this purpose for workmen and agricultural laborers is entrusted to people of their own occupations. Technical advisers have been appointed to prove to them that they can assure for themselves a satisfactory future. On the other hand, the Commission of the Senate on the Army has approved Mr. P. Strauss' report on the proposition adopted by the Chamber of Deputies which renders obligatory the vocational reeducation of the mutilated benefiting under the law of military pensions.

AMBULANCE TREATMENT OF FIREARM WOUNDS OF BONE SHAFTS

While the question of immediate intervention or abstention for firearm wounds of joints has given rise to important discussions, the corresponding question for lesions of the shaft has been comparatively neglected. This renders interesting the communication made to the Société de chirurgie de Paris by Dr. R. Picqué, hospital surgeon. He describes three types of lesions, and on this classification he bases the therapeutic indications: (1) lesions from bullets in direct flight at moderate distances; (2) lesions by artillery projectiles or by spent bullets at great distances; (3) lesions from bullets in direct flight or in ricochet at short distances. Wounds of the first class are comparatively rare in the present war, and they present themselves in all varieties from simple symmetrical fissures described by Delorme to the most comminuted fracture of the fundamental "butterfly wing" form described by Bornhaupt. In such cases, abstention is indicated, and the surgeon who systematically opened up the orifice in the soft tissues in an attempt to remove all the fragments would disturb the long butterfly wing fragments which are well covered with periosteum and scarcely movable. Immobilization is more important here than surgical action. But this primitive abstention must be accompanied by a continuous vigilance. In case infection manifests itself by subacute osteomyelitis or finally by fistulas, the surgical action must be undertaken, the affected area must be thoroughly cleaned, all splinters must be removed, etc. Artillery projectiles or spent bullets produce characteristic voluminous irregular and not very profound wounds of the most varied shapes and sizes. In this, if splinters are visible, the majority of them will be found movable, hanging merely by fragments of periosteum or contused muscle and themselves seriously affected in their nutrition by the shock of the projectile. The remains of the medullary canal frequently contain fragments of projectile, and the marrow is contused. The worst kind of infection threatens in such wounds, which often conceal, together with fragments of the projectile, pieces of clothing, of the military booklet or of the identification disk. These were the lesions which, at the commencement of the war, produced so large a portion of fatal results. The first point in the treatment, therefore, will be to open up the wound for immediate disinfection and to assure drainage. The first step here combines the free division of the aponeurosis, hemostasis, the reestablishment of the nervous circuit, resection of contused muscle, and a thorough cleansing out of all interstices in order to remove foreign bodies. The latter are generally fragments of clothes at the orifice of entry, and bone splinters at the orifice of exit. The second step is the removal of the bony fragments: not blind extraction of splinters adherent or not with the periosteum, without regard to topography or size, but careful and methodical subperiosteal removal of fragments in order to provide free drainage for the medullary canal.

Trench warfare has increased the frequency of serious injuries due to bullets in ricochet. Such projectiles are still possessed of penetrative force superior to that of the majority of shell fragments. They carry with them into the wound débris gathered from the various obstacles with which they have come in contact, and in such circumstances when like the bullet S they are of heterogeneous composition; they act like the cruelest of dumdums. If they come in contact with the bone, they pulverize it and break themselves into innumerable fragments, thus producing the extreme type of wounds that one reads of as caused by explosive bullets. In the immediate neighborhood of the fragments there will be found very few splinters of bone, simply a great loss of substance between two extremities of the fracture. But the soft tissue in the neighborhood is filled with fragments of bone and projectiles. Such wounds are more menaced with infection than others so largely opened. There can be no doubt as to the necessity for intervention in this case. It is necessary by free opening and by the use of the curet and forceps to remove from this soft tissue all that one can of the multiple foreign bodies and to bring into good shape the extremities of the fracture. The result of this resection is frequently a false joint. By applying this method, Picqué has been able to reduce greatly the number of amputations for fractures of the shaft caused by firearms. In 5,378 cases, he was obliged to perform primary or secondary amputation in only thirty-nine.

FRANCE DAY IN GREAT BRITAIN

The French national fête day, July 14, was observed in Great Britain as France's Day for the benefit of the French Red Cross. The results were very satisfactory.

CANADIAN ASSISTANCE FOR THE FRENCH WOUNDED

The president of the Canadian Red Cross, Mr. Marshall, arrived recently in France to distribute material assistance to various works occupying themselves with the welfare of the wounded. After coming to an understanding with the president of the Franco-American committee, M. Hanotaux, the Canadian Red Cross distributed the following subsidies: 50,000 francs ($9,650) to the Société de secours aux blessés militaires; 50,000 francs to the Association des dames françaises; 50,000 francs to the Union des femmes de France; 50,000 francs to the Fédération nationale des mutilés; 50,000 francs to the Oeuvre de secours aux réformés; 50,000 francs to the different organizations for the blind. In addition to these gifts of money, the Canadian Red Cross distributed to the French hospitals 5,000 cases of dressings and clothes and fifteen automobile ambulances. Again, a new hospital, the Laval Hospital, has been added to the important Canadian and French sanitary section at the hippodrome at St. Cloud. This is a gift of the Canadian government, which has chosen a staff from among the members of the university founded in 1852 by Mgr. de Laval at Montreal. This formation includes thirty-seven officers and a staff of 200 volunteers and seventy nurses.

Death of Dr. Alexandre Layet

The death is announced of Dr. Alexandre Layet, formerly professor of hygiene at the Faculté de médecine de Bordeaux, member of the Superior Council of Hygiene, and national correspondent of the Académie de médecine.

LONDON LETTER

London, Aug. 7, 1916.

Sir William Ramsay

The eminent chemist, Sir William Ramsay, has died at the age of 63. He was the nephew of the Scottish geologist, Sir A. C. Ramsay, and came of a family which had been concerned in chemical processes for seven generations. He attended the University of Glasgow, his native city, until 18, and then went to study chemistry under Bunsen at Heidelberg. In 1880 he was appointed professor of chemistry at University College, Bristol, and in 1887 he succeeded Williamson at University College, London. He is best known for the discovery of the "inert gases" of the atmosphere. Taking advantage of the fact that heated magnesium absorbs nitrogen, he treated nitrogen from the air with it, and found that the gas was not wholly absorbed and that the residue was denser than nitrogen prepared by chemical means. The inference was that some other constituent was present. The same conclusion had been reached by Lord Rayleigh by another method in which the nitrogen was removed by the electric spark. The result was that the existence of a new element, argon, was announced by the two investigators jointly to the British Association at Oxford in 1894. Ramsay next proceeded to examine the nitrogen given off by certain minerals, and in one of these, uraninite, he detected helium, a gas which more than a quarter of a century before had been found in the sun by the spectroscope, but which had not previously been known to exist on the earth. Three years later he found that the gas which had been called argon was not homogeneous, but contained also three companion gases —neon, krypton and xenon—and thus added three substances to the list of the elements. Later helium provided him with another triumph, for in 1903 he and his pupil, Professor Soddy, were able to prove, as had been suggested would be the case in view of the fact that it is constantly found in radioactive minerals, that it is one of the disintegration products of radium and its emanation. He soon realized that the study of radium would throw light on the nature of the elements and their transformation into one another. He demonstrated that radium was constantly disappearing to reappear in new elemental forms. He mapped out the series of elements due to the degradation of radium and thought that in the course of his experiments he had found evidence of similar disintegration of more common elements. He stated that he had found traces of lithium in the residues of solutions of copper sulphate and nitrate exposed to radium emanation. He did some work on the therapeutic applications of radium. He made an exhaustive investigation into the properties of the celebrated Bath waters, and demonstrated that the one thing which distinguished these waters was their remarkable radioactive power. He could attach no therapeutic significance to the mere mineral constituents of the

waters, which were much the same in kind and degree as those found in the London drinking supply. He pointed out that radium is best applied for therapeutic purposes in the shape of emanation or niton than as a salt of radium, on the ground that in the latter case there is considerable risk of loss of the precious radium.

The Annual Meeting of the British Medical Association

The eighty-fourth annual meeting of the British Medical Association has been held in London. In consequence of the war, the scientific and social side was entirely dropped and only political matters were discussed. Some of these were of great importance. The principal one was the position occupied by the physician with reference to the proposed state treatment of venereal diseases. As stated in previous letters, the government, following the advice of the commission appointed to investigate the subject, is about to organize laboratory facilities and skilled free treatment, the measures being entrusted to councils of counties and to county boroughs. Seventy-five per cent. of the cost is to be provided out of the imperial exchequer. Clinics are to be established, and salvarsan or its substitutes to be provided gratuitously. Considerable apprehension was expressed as to this inroad on the work of the general physician. It was decided that a deputation should be sent to the local government board to secure a pledge that an order would be issued requiring every local authority to consult with the representative of the local medical profession throughout all stages of the scheme. One representative protested against the publicity which had been given to salvarsan and its substitutes in the recommendation and reports. There was no evidence that the drug was the proper treatment of syphilis. Mercury was the proper treatment, and the profession was confronted by wholesale proposals for treatment by salvarsan. Some of the deaths which had occurred were not due to faulty administration, as had been alleged, but to the drug itself.

The Cocain Habit Among Soldiers

Among the large number of soldiers, invalided and otherwise, in this country, cases of the cocain habit have attracted notice, and a surreptitious traffic in the drug in saloons and other places has been detected. Drastic action has been taken by the government against this scandal. The importation of cocain is prohibited except under a license, and it is made an offense to be in possession of the drug except under stated conditions. The gift as well as the sale of the drug to the victims of the cocain habit is made an offense. Cocain can be supplied only in accordance with a physician's prescription and by a legally qualified pharmacist. The prescription must be dated and signed by the physician with his full name and address, and marked with the words "not to be repeated." If repetition is required, this must be endorsed by the physician on the prescription and dated.

Substitutes for Cocain in Dentistry

The accidents arising from the use of cocain by the large number of unqualified persons who practice dentistry has led the government to restrict the use of this drug. The government has arranged to make available a sufficient supply of novocain for use as a local anesthetic, in place of cocain, by practicing dentists, whether registered or unregistered. As the supply is not immediately available in the particular forms usually required for dental purposes, and three or four weeks may elapse before it can be made available in these forms, the government has granted a temporary permit to all persons engaged, July 28, 1916, in the bona fide practice of dentistry, but not to purchase preparations containing more than 1 per cent. of cocain, adapted for use as local anesthetic in connection with dental work, subject to the condition that the preparations are used as local anesthetics in connection with such work and for no other purpose. The permit will remain in force until September 15 next. After that date it will not be legal for unregistered dentists to continue to use cocain preparations. Public notice will be given in good time stating how and where the novocain preparations can be obtained. The government calls attention to the fact that eucain is being manufactured on an increasing scale in this country, and it is probable that considerable supplies of this drug also will be available shortly to meet the demand for local anesthetics for dental purposes.

Physicians Killed in the War

According to the report presented to the British Medical Association, more than 400 physicians have lost their lives at the front in the past twelve months.

Marriages

WILLIAM ALBERT MUDGE, M.D., Nashwauk, Minn., to Miss Vendla E. Martin of Chicago, at Duluth, Minn., August 2.

ROBERT W. LENKER, M.D., West Leesport, Pa., to Miss May C. Yeager of Reading, Pa., at Philadelphia, August 1.

WILLIAM TURNER EIKNER, M.D., Sidney, Neb., to Miss Frances Alice Johnson of Holdrege, Neb., June 12.

BROWN S. MCCLINTIC, M.D., Peru, Ind., to Miss Eleanor Soukupp of Kansas, at Kermanshah, Persia, June 1.

EDWARD DEWALT ALLEN, M.D., Hampton, Ia., to Miss Helen Thompson of Emporia, Kan., in Chicago, recently.

ROBERT N. MILLER, M.D., Beaumont, Tex., to Miss L. K. Jones of Nashville, Tenn., at Beaumont, August 4.

RALPH STEPHEN CHAPPELL, M.D., to Miss Helen M. Warrum, both of Indianapolis, August 12.

Deaths

John B. Maloney, M.D., Key West, Fla.; University of Pennsylvania, Philadelphia, 1890; aged 48; a Fellow of the American Medical Association; formerly mayor of Key West; founder of the Louise Maloney Hospital; a member of the board of education for three years; a member of the Florida Medical Examining Board and for three terms president of the Key West Board of Trade and for several years port health officer; surgeon-major in the Florida National Guard (retired); local surgeon for the Florida East Coast Railway extension; died in the Kensington Hospital, Philadelphia, August 7.

Harry Daingerfield Barnitz, M.D., San Antonio, Texas; Georgetown University, Washington, D. C., 1880; aged 63; formerly a Fellow of the American Medical Association; a member of the State Medical Association of Texas; formerly president of the Board of Health of San Antonio; formerly president of the West Texas Medical Association and a member of the board of managers of the State Insane Hospital, Texas; acting assistant surgeon, U. S. Army, immediately after his graduation with station at Fort McKinney, Wyo.; died at his home, August 6.

John Alva McCorkle, M.D., Brooklyn; University of Michigan, Ann Arbor, 1873; aged 69; a Fellow of the American Medical Association and New York Academy of Medicine; professor of principles and practice of medicine and clinical medicine in Long Island College Hospital and president of the Long Island College; physician to the Long Island State Hospital; visiting physician to the Long Island County Hospital and consulting physician to the Norwegian, Jewish and St. John's hospitals, Brooklyn; died in New York City, August 16.

John Martin Crawford, M.D., Cincinnati; Pulte Medical College, Cincinnati, 1879; Miami Medical College, 1881; aged 70; professor of obstetrics, neurology, physiology and physical diagnosis in his alma mater from 1881 to 1889; physician to the Cincinnati Home for the Friendless; president of the Western Academy of Medicine in 1888; a banker; United States consul-general to Russia from 1889 to 1894; and since his return a lecturer on the ancient Finns and European and Asiatic Russia; died at his home, August 12, from hemorrhage.

John Macauley Eager, M.D., Surgeon, U. S. P. H. S.; Naples, Italy; College of Physicians and Surgeons in the City of New York, 1888; aged 52; who entered the Public Health Service as assistant surgeon, Feb. 16, 1891; four years later became passed assistant surgeon, and was promoted to surgeon, Dec. 19, 1907; who had been on duty in Italy, in 1910, in connection with the cholera epidemic, and was sent back to Naples for duty in 1912; died in Naples, August 18.

Major Robert Newton Winn, Jr., M. C., U. S. Army; Bellevue Hospital Medical College, 1897; aged 43; a Fellow of the American Medical Association; assistant surgeon of volunteers during the Spanish-American War; who entered the Medical Corps of the army in 1900; became captain five years later and major in 1909; chief surgeon of the U. S. General Hospital, Eagle Pass, Texas; died in that institution, August 12, from pneumonia.

John Bart Webster, M.D., Philadelphia; Medico-Chirurgical College of Philadelphia, 1887; aged 80; a Fellow of the

American Medical Association; who participated in the relief of Lucknow; was clerk of his faculty of the collegiate department of the University of Pennsylvania for many years, and later a practitioner of Atlantic City; died at his home in Philadelphia, August 9, from heat exhaustion.

Wentworth Larrabee Hayes, M.D., Cambridge, Mass.; Tufts College Medical School, Boston, 1900; aged 39; formerly a Fellow of the American Medical Association; a member of the Massachusetts Medical Society; a medical inspector of Cambridge schools and a member of the visiting staff of the Cambridge Hospital; died in South Yarmouth, Mass., August 12, from pneumonia.

Alexander Browne, M.D., Philadelphia; University of Pennsylvania, Philadelphia, 1867; aged 73; a veteran of the Civil War in which he served as steward-surgeon in the U. S. Navy and later was ordered to New Orleans during the epidemic of smallpox and yellow fever; who retired from practice about thirty years ago; died suddenly in Shenandoah, Pa., August 10.

Albert T. Mobley, M.D., New Columbia, Ill.; Kentucky School of Medicine, Louisville, 1880; aged 70; formerly a Fellow of the American Medical Association; also a druggist; who served in both the army and navy during the Civil War; died in a hospital in St. Louis, July 29, after a surgical operation for the relief of disease of the kidney.

Hugh L. McLauren, M.D., Dallas, Texas; Tulane University, New Orleans, 1884; aged 55; a Fellow of the American Medical Association; for two years superintendent of the Mississippi State Sanatorium, Vicksburg; division surgeon to the Texas, New Orleans and Pacific Railroad; died at his home, August 11, from cerebral hemorrhage.

Clinton DeWitt VanDyck, M.D., New York; Albany (N. Y.) Medical College, 1879; aged 61; a member of the Medical Society of the State of New York and for twenty-six years medical supervisor for the Metropolitan Life Insurance Company; died in Atlantic City, N. J., August 10, from cerebral hemorrhage.

Miles C. Dunn, M.D., Henderson, Ky.; University of Louisville, Ky., 1892; aged 52; a member of the Kentucky State Medical Association; a specialist in diseases of the eye, ear, nose and throat; president of the Henderson Board of Health and school board; was shot and killed on the street in Henderson, August 10.

James D. Weaver, M.D., Eatonton, Ga.; College of Physicians and Surgeons, Baltimore, 1882; aged 56; a member of the Medical Association of Georgia; a member of the state board of health; who was run over by an automobile in Eatonton, August 4; died a day later as the result of his injuries.

William Henry Yeager, M.D., Philadelphia; Hahnemann Medical College, Philadelphia, 1900; aged 44; associate professor of therapeutics and clinical medicine in his alma mater; a member of the staff of Hahnemann Hospital; died in that institution, August 4, from appendicitis.

Sylvester W. Sellew, M.D., Oil City, Pa.; Homeopathic Hospital College, Cleveland, 1882; aged 59; a member of the Medical Society of the State of Pennsylvania; was accidentally drowned while bathing at Henry's Bend, near Oil City, August 8.

Joseph Logue Lockary, M.D., Roxbury, Boston; McGill University, Montreal, 1897; aged 44; a Fellow of the American Medical Association and in charge of the Children's Clinic at Tremont, Mass.; died at St. Stephen, N. B., August 13.

Wooster Beach, M.D., Westchester, N. Y.; College of Physicians and Surgeons in the City of New York, 1854; aged 84; one of the founders and first president of the Medico-Legal Society of New York; died at his home, August 6.

William Gutch Haning, M.D., Belleville, Kan.; Rush Medical College, 1890; aged 57; formerly a Fellow of the American Medical Association; died at Rochester, Minn., August 8, after an operation for the removal of gallstones.

Charles Rideny Sharp, M.D., Nashville, Tenn.; Universities of Nashville and Tennessee, Nashville, 1911; aged 32; a member of the Tennessee State Medical Association; died at the home of his parents in Nashville, August 4.

Henry Coolidge Frost, M.D., Buffalo; Homeopathic Hospital College, Cleveland, 1874; aged 67; senior surgeon of the Buffalo Homeopathic Hospital; while taking a trip with his son, died in Montreal, July 25, from nephritis.

Girard F. Knowles, M.D., Manistee, Mich.; Hahnemann Medical College, Chicago, 1882; aged 58; formerly a Fellow of the American Medical Association; a member of the Michigan State Medical Society; died at his home, August 4, from anemia.

Samuel Ellsworth Yoder, M.D., Wymore, Neb.; University of Michigan, Ann Arbor, 1889; aged 52; a member of the Nebraska State Medical Association; died in a hospital in Lincoln, August 4, from heart disease.

James Edward Leary, M.D., Lowell, Mass.; College of Physicians and Surgeons, Baltimore, 1894; aged 42; formerly a member of the Massachusetts Medical Society; died at his home, June 11, from heart disease.

Oliver Marshall Steadham, M.D., Auburn, Ala.; Chattanooga (Tenn.) Medical College, 1894; a member of the Medical Association of the State of Alabama; died at his home, August 11, from arteriosclerosis.

Waldemar Dorfman, M.D., New York; University of Berne, Switzerland, 1882; aged 62; for six years a surgeon for the Hamburg-American Steamship Line; died at his home, August 10, from heart disease.

Adam J. Blessing, M.D., Albany, N. Y.; Albany (N. Y.) Medical College, 1886; aged 51; a member of the Medical Society of the State of New York; died at his summer home in Sacandaga, N. Y., August 6.

Solomon Sheridan Owen, M.D., Moore, Mont.; College of Physicians and Surgeons, Kansas City, Kan., 1904; aged 48; was instantly killed by the overturning of his automobile near Moore, August 6.

Eli B. Haynes, M.D., Marble Rock, Iowa; Vermont Medical College, Woodstock, 1850; aged 89; a pioneer practitioner of Floyd County, Iowa; died at his home in Marble Rock, August 10.

Everett P. Courtright, M.D., Newark, N. J.; Jefferson Medical College, 1890; aged 47; a member of the Medical Society of New Jersey; died at his home, June 28, from cirrhosis of the liver.

Kenneth D. Wise, M.D., Los Angeles; Jefferson Medical College, 1865; aged 83; a veteran of the Civil War; for forty-four years a practitioner of Los Angeles; died at his home, July 31.

George Rauchfuss, M.D., New York; College of Physicians and Surgeons in the City of New York, 1895; aged 50; for several years in the naval service; died at his home, July 31.

Earl Amzie Stickle, M.D., Kenton, Ohio; University of Michigan Homeopathic Medical College, Ann Arbor, 1909; aged 34; died in the Grant Hospital, Columbus, Ohio, July 30.

Hesekiah V. Brown, M.D., Portland, Ind.; Starling Medical College, Columbus, 1882; aged 76; a veteran of the Civil War; died at his home, July 28, from cerebral hemorrhage.

Andrew L. Van Patten, M.D., Los Angeles; Hahnemann Medical College, Chicago, 1876; aged 71; formerly of Chicago; died at his home, August 3, from heart disease.

Henri Prevost, M.D., St. Jerome, Que.; University of the Victoria College, Coburg, Ont., 1889; aged 53; died at his home, April 21, from malignant disease.

Edwin M. Orr, Hot Springs, Ark. (license, Arkansas, 1903); aged 46; surgeon to a lumber company at Parkin, Ark.; died at his home in Hot Springs, August 10.

Marion H. Dinsmore, M.D., Sharpsburg, Pa.; Hahnemann Medical College, Philadelphia, 1911; aged 34; died at his home, August 30, from heart disease.

David Henry Lancaster, M.D., Culloden, Ont.; Cleveland University of Medicine and Surgery, 1863; aged 78; died at his home, April 23, from diabetes.

Jesse Henry Deer, M.D., Zionsville, Ind.; Medical College of Indiana, Indianapolis, 1903; died August 2, at Indianapolis, while being taken to a hospital.

George Wesley Shaffer, M.D., Creamridge, N. J.; Hahnemann Medical College, Philadelphia, 1877; aged 63; died at his home, about July 30.

Christian G. Weiss, M.D., Indianapolis; Hospital College of Medicine, Louisville, 1895; aged 80; also a druggist; died at his home, August 2.

Cary Nelson Dunlap, M.D., Middlebrook, Va.; College of Physicians and Surgeons, Baltimore, 1893; aged 46; died at his home, August 2.

Francis V. Carden, M.D., Coatesville, Pa.; University of Louisville, Ky., 1908; aged 33; died at his home, July 31.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

A RECENT REPORT ON FOODS AND DRUGS

The chief chemist of the Connecticut Agricultural Experiment Station, J. P. Street, calls attention[1] to the fact that now, for the first time, certain manufacturers of food products are beginning to make claims that their output is "rich in vitamins." The billboards and advertising placards, as well as circular reading notices, have long expounded the hypothetic virtues of "phosphates" as "brain food" and of other "vitalizing" ingredients in ready-to-serve foods or similar dietary preparations; hence the advent of vitamin into popular knowledge has been accorded a prompt reception. Street's presentation of the present status of the subject seems so reasonable and sane that it deserves to be quoted:

"Feeding experiments with 'purified or partly purified' foods, or with artificial mixtures containing all of the *known* ingredients heretofore supposed to be essential for the support of life, have shown that some still unknown substance or substances must be present in a food in order to make it capable of long supporting life. The nature of these substances is at present entirely unknown, their existence being assumed from the effect produced by adding small amounts of extracts of or parts of various vegetable or animal tissues to the above mentioned inefficient diets. Probably the so-called 'vitamines' include a variety of chemical substances which are widely distributed throughout the animal and vegetable tissues. As a consequence nearly all of the unmanipulated food products contain enough of these vitamines to supply the requirements of normal nutrition.

"The claim that a food is 'rich in vitamines,' even if true, adds little to its value, for, however essential these substances may be, they are so widely distributed among all of the common articles of food that every person who has an ordinary normal diet gets quite enough of them. The phrase does not carry with it the idea of any special process having been used, or even any special food having been selected, but rather that natural, unmanipulated foods are present, and that the manufacturer, alert to the advertising value of a new catch phrase, claims for his product a virtue common to the majority of our most familiar foods."

Proprietary infant foods play an important part in the nutrition of the people. A comparison of the composition of a number of widely used brands at an interval of seven years shows that the differences at the two inspection periods have, as a rule, not been great. The different brands, of course, show decided dissimilarities, such as the complete absence or the great abundance of starch, the unlike protein content, and the divergences in the quantity of fat, as well as in the sources of the nutrients in the product as sold. Most of them are, however, not intended for consumption without either some preliminary treatment or modification with milk or other adjuvants. A fair representation of the comparative composition or merits can be made, therefore, only by analyzing the products in the form intended for direct consumption. A comparison made in this way by Street shows divergences as wide as the difference of opinions among pediatricians respecting the ideal food for infants. The claims of the manufacturers are usually less modest. Three products are asserted respectively to exhibit: "The nearest approach to mother's milk that can ever be produced and remain permanent," or the "composition is nearly identical with that of mother's milk," or the "composition shows a close resemblance to mother's milk." An inspection of the composition of feeding mixtures prepared from these three foods has led the chemist to remark that if the manufacturers' claims are correct, human milk in Jersey City, N. J., Battle Creek, Mich., and in Vevey, Switzerland, must be an exceedingly variable product.

The drug situation still shows some disconcerting aspects. For example, of twenty-five samples of chlorinated lime (bleaching powder) which, according to the United States Pharmacopeia, should contain "not less than 30 per cent. of available chlorin," only three were found of full strength. Eight contained but traces of available chlorin. This is a dangerous situation when it is recalled that the public as well as the medical profession puts great dependence on the disinfecting powers of this inexpensive material, bleaching powder being commonly regarded as one of the most useful household disinfectants. There is not necessarily any intentional fraud in dispensing an inactive product. Street points out that chlorinated lime deteriorates quickly, especially in containers which are not tightly closed, so that when a deficient sample is found it is difficult to place the responsibility. The original material as it came from the manufacturer might be of inferior quality, the sample might represent stock kept too long on the druggists' shelves, or the deterioration might be due to an improper kind of container. Whatever the cause of the inferiority, the consumer would have placed dependence on a product that could not secure the desired results. Doubtless there is great need, at present, of a suitable container for so useful a product.

The results of the Connecticut inspection show the mercury ointments of the United States Pharmacopeia are often liable to be confused. A request for "mercurial ointment" may bring "blue ointment" or "ointment ammoniated mercury." The necessity for both the strong and the dilute ointments, says Street, has often been questioned. At any rate confusion certainly exists in the minds of many druggists as to the true significance of the names of the three mercury ointments carrying approximately 50, 33.5 and 10 per cent. of the metal. It further seems to be not uncommon to dispense these poisonous ointments without any warning, in the form of a special label, as to the dangerous nature of the product.

The propaganda for reform in proprietary medicines and the enforcement of the laws in relation thereto is beginning to bear fruit in that the presence of dangerous and habit-forming drugs (other than alcohol) appears to be becoming less frequent. The review of the situation in Connecticut is summarized as follows: Of the forty-nine samples examined last year, only ten contained dangerous drugs other than alcohol:

1 acetanilid	1 fusel oil
1 acetphenetidin	3 lead acetate
1 arsenic	1 silver nitrate
1 bromide	1 strychnin

The claims on the labels and in the literature accompanying the medicines, though far from perfect, likewise show an improvement. This is largely due to the Sherley amendment of the federal Food and Drugs Act which prohibits false and fraudulent therapeutic claims. The newspaper advertising of many of these preparations, however, is still viciously bad. That the day of honest advertising is approaching is obvious to any close observer, and no agency is hastening that day so much as the false and dangerous advertisements of "patent medicines."

In recent years considerable suspicion has become attached to the cheapest grades of whisky sold over the bar in our larger cities. An investigation conducted in Connecticut failed to demonstrate the presence of wood alcohol, ether or chloral in any of the large number of samples examined. Almost any alcoholic beverage may be sold under the name of whisky, provided it contains from 45 to 50 per cent. of alcohol derived from grains. It appears from this most recent investigation that the commonest means employed by the compounders and dealers to cheapen their whisky is the addition of water. This is attested by the fact that out of 123 samples of bar whisky, only fifty were of full alcoholic strength. From the standpoint of temperance, says Street, this practice may not be without its advantages, but the commercial fraud is not the less real.

1. Street, J. P.: Report of the Connecticut Agricultural Experiment Station, 1913, Part V, Food Products and Drugs.

Correspondence

E Pluribus Unum Forever

To the Editor:—Today, when we have so much agitation on the subjects of industrial accident insurance, health insurance of sundry kinds, and all manner of hospital associations, why would it not be a step in advance for the United States government, cooperating with state and counties, to establish a department of public health whereby free medical, surgical and dental care, including hospital service when necessary, would be provided for all the people? I know from personal experience, gained through seven years of service in the mines of Calaveras County, where medical attention was given to all the miners including their families for what seemed to be a nominal fee, that the general health of the community was far above the average of communities where each individual has to pay for this service, obtain it as a gratuity from the medical practitioner, or go to the county hospital.

If adequate medical service were provided by the government, the working efficiency of the people could be increased from 15 to 20 per cent. All defectives could be given the best possible treatment, deformities corrected, and a large majority of diseases now prevalent could be absolutely eradicated. In fact, they, like the dodo bird, would become an extinct curiosity.

On the other hand, if medical attention, including its collateral branches, were supplied by the government, the standing and educational requirements of those rendering it and their efficiency could be increased far in excess of the general average of the same service as now rendered. If physicians and others employed in this service were required to devote one month each year to special work along their lines, they would be kept up to date and take a greater interest in their work. They should also be allowed one month's vacation in which to rest and recuperate, for all work and no play is detrimental to human progress. A system of taxation could be arranged whereby this could be accomplished, working no hardships to the masses of people, and at the same time providing for them a health insurance that could not be equaled in any other way.

I offer the foregoing suggestions as I believe sincerely in the doctrines of equal rights to all and special privileges to none.

W. C. Shipley, M.D., Cloverdale, Calif.

Federal Aid for Indigent Consumptives

To the Editor:—That the tuberculosis problem is one in which the federal government should be deeply interested, no one can dispute. I think it is open to question, however, as to how the Kent bill—for which Dr. Brown makes a strong plea in his letter to The Journal of August 5—will solve the problem. On the other hand, there are certain disadvantages to the measure advocated which must tend to increase, rather than to solve, the various problems to be met.

I speak from the point of view of those located at a resort town. It is only such who have any idea of the number of tuberculous invalids from all sections of the country—many in advanced stages and insufficiently provided with means—who migrate to the health resort, hoping that a stay of a few months will arrest the progress of the disease. It is only those living in resorts who have any idea of the number of these persons who become a burden on the community and must either be supported by the charitable institutions or returned to their homes. Now, while at first sight it might seem that the so-called federal subsidy bill would solve the problems connected with the migratory consumptive, I think that a little consideration of the question is enough to convince one that there are certain very decided objections to the plan as outlined in the bill.

I should like to point out, as the first result of the passing of this bill, the increased migration of consumptives; any locality tagged with the government seal would have its difficulties added to, not removed. And though the bill provides that the individual may not secure federal assistance unless it is shown that he "did not migrate and was not assisted in migration to secure aid under this act," it would be difficult and perplexing to decide just who should be entitled to aid. Dr. Brown has admitted that, in California, 30 per cent. are indigent when they arrive, and 20 per cent. become so within a year. At any rate, those not eligible for admission to an institution must be either supported or returned to their homes.

Again, the government is not doing the state or municipality a favor by permitting application for a subvention; what it is doing, if the subvention be granted, is to permit the quartering of federal or interstate consumptives in institutions intended for use of the local indigent, thus depriving the latter of the full use of institutions which, at best, are able to care for only a small number of the local sick.

Further, it does not seem just or reasonable that the local taxpayer, unable as he is to care properly for his own sick, should be compelled, in addition, to contribute one half the support of the migratory cases of tuberculosis.

Moreover, the migration of consumptives is only a small part of the tuberculosis problem: the bill in no way provides for the most important questions which arise in the case of every tuberculous person discharged from an institution, namely, the questions of proper after-treatment and employment for arrested cases. In fact, I can see few virtues to the bill, but several decided disadvantages.

We do not need the law. If the resolutions of the Executive Committee of the National Association for the Study and Prevention of Tuberculosis expressed last January and confirmed by the board be acted on—resolutions providing for an endorsement of federal participation in the tuberculosis campaign, with the request for a division of tuberculosis in the U. S. Public Health Service, and the suggestion that an advisory council of the latter, or an independent commission for the study of tuberculosis be appointed and financed by the federal government—we shall have a much better weapon with which to fight tuberculosis than by the passage of the Kent bill.

Thompson Frazer, M.D., Asheville, N. C.

Dr. Lydston vs. Jenner Medical College

To the Editor:—In the current prospectus of the Jenner Medical College my name appears as a member of the faculty. I wish to state that I am not, nor have I ever been, officially connected with the aforesaid school. My name, as a faculty member, was used without my knowledge or consent and without any negotiations with the institution bearing on a faculty position. My relations with the Jenner Medical College simply consist in my having consented to give a few special lectures on surgical subjects during the coming term.

G. Frank Lydston, M.D., Chicago.

Queries and Minor Notes

Anonymous Communications and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

TRANSMISSION OF HEART AND LUNG SOUNDS THROUGH SOLIDS

To the Editor:—1. In the *Scientific American*, July 15, 1916, is an article entitled "New Apparatus for Internal Diagnosis." It describes the invention of Dr. J. Glover whereby heart and lung sounds can be read and diagnosed with mathematical accuracy by the fluctuations of the galvanometer. Has this invention proved of scientific value?

F. W. Bremer, M.D., Pittsburgh.

Answer.—A description of the principle of this apparatus will be found in *Comptes rendus de l'Académie des sciences*, May 17, 1915. Dr. Glover received the Lallemand prize in physiology in 1915 for his investigations along the line of sound conduction through solid mediums. An article relative to the clinical application of this instrument was published in the *Bulletin de l'Académie de médecine*, Feb. 22, 1916,

p. 233 and abstracted in THE JOURNAL, April 8, 1916, p. 1171. As suggested by our correspondent, the most important feature of the instrument is a galvanometer connected with a microphone which is placed in contact with the chest. Variations in the intensity of the sounds transmitted through the solid mediums of the thoracic wall cause oscillations in the needle of the galvanometer, and these oscillations can be graphically recorded. At the same time they may be heard through a telephone attachment.

It is intimated by the author that with this instrument it is possible to diagnose very early pulmonary tuberculosis by characteristic oscillations in the needle of the galvanometer produced primarily by the breath sounds. A graphic record of these oscillations can, as stated, be made.

Undoubtedly a method of accurately recording the pulmonary and cardiac sounds in health and disease would be a great advance in diagnostic methods, but this instrument is exceedingly complicated, and much work must be done with it before its norms are really established. The great value of the electrocardiograph in diagnosis suggests that this instrument may ultimately prove useful, as in some respects they are similar.

WORK OF MEDICAL MISSIONARIES

To the Editor:—Having an interest in the subject of medical missions in countries outside of the United States, I desire to institute a research among the published accounts of the labors of such missionaries. Can you give me a list of publications which will serve as a basis for my investigations?

BURTON CHANCE, M.D., Philadelphia.

ANSWER.—The following is a list of references on this subject:

Bartlett, C. J.: Peter Parker, the Founder of Modern Medical Missions, THE JOURNAL, Aug. 5, 1916, p. 407.

Van Metre, T.: Training of Medical Missionaries, THE JOURNAL, Feb. 12, 1916, p. 529.

Arnold, H. D.: Preparation of Medical Missionary for his Task, abstr., THE JOURNAL, April 22, 1916, p. 1349.

Hoover, A. R.: Different Types of Medical Service Called for in the Foreign Field and Personal Qualifications Essential to Success, abstr., THE JOURNAL, April 22, 1916, p. 1349.

Speer, R. E.: Fundamental Objectives and Purpose of Medical Missionary Work from Standpoint of Missionary Administration, abstr., THE JOURNAL, April 22, 1916, p. 1350.

Allen, B.: Preparation of Women for Medical Mission Service, and How it Should be Differentiated, if at all, from That of Men, abstr., THE JOURNAL, April 22, 1916, p. 1350.

Harrison, P. W.: Preparation of Medical Missionaries in Addition to their Medical Studies, abstr., THE JOURNAL, April 22, 1916, p. 1350.

Medical Missionaries, Medical News, THE JOURNAL, April 29, 1916, p. 1397.

Boyd, N. W.: American Presbyterian Mission, Canton, China; Melrose, J. A.: Larger Meaning of Medical Missions, *Bull. Am. Acad. Med.*, June, 1914.

Corner, G. W.: Hospital Work of Laborador Mission, *Mod. Hosp.*, August, 1914.

Research in Medical Missions, editorial, THE JOURNAL, Jan. 24, 1914, p. 305.

Van Vloten, H.: Experiences of Medical Missionary in Interior of China, *Deutsch. med. Wchnschr.*, 1915, Nos. 1 and 2.

Merrins, E. M.: Work of Medical Missionary Association of China; Bulkley, L. C.: Medical Mission Work in Siam, *Jour. sociologie méd.*, April, 1915.

Training of Medical Missionaries, editorial, THE JOURNAL, Aug. 21, 1915, p. 723.

Scharlieb, M.: Care of Health of Married Women Missionaries, *Brit. Med. Jour.*, May 29, 1915.

MACEWEN'S SIGN—BIOT'S RESPIRATION—BRUDZINSKI'S SIGN

To the Editor:—Please inform me (1) what Macewen's sign of hydrocephalus is. 2. What is Biot's type of respiration, and what is its connection with infantile paralysis? 3. What is Brudzinski's sign and reflex?

CHARLES A. SELLERS, M.D., Hartford City, Ind.

ANSWER.—1. Macewen's sign is a tympanitic note elicited on percussion over the anterior horn of the lateral ventricle. Place the bell of the stethoscope on the forehead and percuss over the squamous part of the temporal bone. The note occurs in chronic hydrocephalus, in rachitis in infants, and in tuberculous and epidemic cerebrospinal meningitis.

2. Biot's respiration is an occasional arrest of respiratory movements from a few seconds up to half a minute. It occurs characteristically in intracranial disorders, especially meningitis, but has also been observed in other grave disorders. It might occur in certain types of infantile paralysis.

3. Brudzinski's sign in meningitis is a flexure movement of the ankle, knee and hip, when the neck of the patient is bent; also, when passive flexion of the lower limb on one side is made, a similar movement occurs with the other lower limb.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

CALIFORNIA: Los Angeles, Oct. 3. Sec., Dr. Charles B. Pinkham, Room 527 Forum Bldg., Sacramento.

COLORADO: Denver, Oct. 3. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

IDAHO: Wallace, Oct. 3. Sec., Dr. Charles A. Dettman, Burke.

MASSACHUSETTS: Boston, Sept. 12-14. Sec., Dr. Walter P. Bowers, Room 501, No. 1 Beacon St., Boston.

MINNESOTA: Minneapolis, Oct. 3-6. Sec., Dr. Thomas S. McDavitt, 814 Lowry Bldg., St. Paul.

MISSOURI: Kansas City, Sept. 18-20. Sec., Dr. J. A. B. Adcock, State House, Jefferson City.

MONTANA: Helena, Oct. 3. Sec., Dr. William C. Riddell, Helena.

NEW YORK: Albany, Buffalo, New York and Syracuse, Sept., 19-22. Mr. Harlan H. Horner, Chief Examinations Division, The University of the State of New York, State Department of Education, Albany.

PORTO RICO: San Juan, Oct. 3. Sec., Dr. Quevedo Baez, San Juan.

Massachusetts March Report

Dr. Walter P. Bowers, secretary of the Massachusetts Board of Registration in Medicine, reports the oral, practical and written examination held at Boston, March 14-16, 1916. The total number of subjects examined in was 14; total number of questions asked, 70; percentage required to pass, 75. The total number of candidates examined was 41, of whom 30 passed, including 2 osteopaths, and 11 failed, including 4 osteopaths. The following colleges were represented:

PASSED College	Year Grad.	Per Cent.
Georgetown University	(1915)	80
George Washington University	(1912)	78.5
American Medical Missionary College, Chicago	(1906)	78.2
Bennett Medical College	(1915)	78
College of Physicians and Surgeons, Baltimore	(1915)	80.2, 83.1
Johns Hopkins University	(1914)	81
University of Maryland	(1915)	77.5
Boston University	(1915)	81
Harvard University	(1914) 78.2, 81; (1915) 77.6, 82.2;	(1916) 84.9
Tufts College Medical School	(1914) 76.8;	(1915) 75.5, 77.2 81.3
University of Michigan Medical School	(1908)	76.5
Univ. of Minnesota, Coll. of Homeo. Med. and Surg.	(1897)	75
Dartmouth Medical School	(1901)	77.6
Long Island College Hospital	(1914)	79.5
University and Bellevue Hosp. and Medical Coll.	(1914)	80.3
Jefferson Medical College	(1915)	82.2
Woman's Medical College of Pennsylvania	(1914)	81.1
University of Vermont	(1903)	82.2
Royal College of Physicians, England	(1911)	79
University of Paris	(1908)	73

FAILED College	Year Grad.	Per Cent.
Georgetown University	(1910)	68.9
Kentucky School of Medicine	(1905)	*
Maryland Medical College	(1912) 69;	(1913) 69.7, 69.9
College of Physicians and Surgeons, Boston	(1911)	69.7
Laval University	(1906)	*

* Did not complete the examination.

Missouri March Report

Dr. J. A. B. Adcock, secretary of the Missouri State Board of Health, reports the oral and written examination held at St. Louis, March 20-22, 1916. The total number of subjects examined in was 14; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 21, of whom 17 passed and 4 failed. One candidate was granted a reregistration license by examination. The following colleges were represented:

PASSED College	Year Grad.	Per Cent.
Bennett Medical College	(1914)	75, 85.9
College of Med. and Surg., Physio-Med., Chicago	(1911)	77.8
Chicago College of Med. and Surg.	(1915) 78.1;	(1916) 75
Rush Medical College	(1915)	84.8
Ensworth Medical College	(1909)	82.1
Kansas City Hahnemann Medical College	(1915)	79.8
Marion Sims Beaumont Medical College	(1903)	75
National University of Arts and Sciences	(1915)	80.1
St. Louis College of Physicians and Surgeons	(1906)	75.8*
St. Louis University	(1915) 82.4;	(1916) 84.4
University Medical College, Kansas City	(1911)	75.6
Washington University	(1915)	81.4
University of West Tennessee	(1915)	79.7
Dallas Medical College	(1904)	77.9*

FAILED College	Year Grad.	Per Cent.
St. Louis College of Physicians and Surgeons	(1913)	59.1
Meharry Medical College	(1915)	62.7
University of West Tennessee	(1914) 64.8;	(1915) 64

* Graduation not verified.

Book Notices

THE MICROSCOPY OF VEGETABLE FOODS. With Special Reference to the Detection of Adulteration and the Diagnosis of Mixtures. By Andrew L. Winton, Ph.D., with the Collaboration of Dr. Josef Moeller, Professor of Pharmacognosy, University of Vienna, and Kate Barber Winton, Ph.D., Second Edition. Cloth. Price, $6.50. Pp. 701, with 635 illustrations. New York: John Wiley & Sons, 1916.

The title by no means covers the contents of the book, as the different parts comprise: equipment, methods and general principles; grain, its products and impurities; oil seeds and oil cakes; legumes; nuts; fruit and fruit products; vegetables; alkaloidal products and their substitutes; spices and condiments, and commercial starches. The present edition, generally speaking, is the same as that published ten years ago, although a considerable number of drawings have been replaced or entirely new ones introduced, and the text of some of the chapters has been partially or wholly revised. "Additions have been made to the sections on wheat and flour, a complete revision of such parts of the chapter on oil seeds as treat on mustards, rapes, cruciferous weed seeds, and linseed, a description of the histology of alfalfa with distinctions from red and alsike clover, a revision of the sections on pomes and drupes, with practical hints on the examination of almond pastes, jams, preserves and other fruit products, and rewritten descriptions of the cucurbitaceous fruits used as foods and adulterants."

The material is presented in an excellent form; the text and drawings are clear and should be useful even for one who is not particularly familiar with the use of the microscope and microscopic characteristics. The book is especially valuable, since the authors have for a great number of years been engaged in practical microscopic work. But it would be of still greater value to men working along these lines of microscopic work were it more comprehensive. The bibliography of microscopic work done since 1905 is rather incomplete, the literature references up to date being given only in a few chapters. Fortunately, this is usually not such a serious drawback in microscopic work, since morphologic or anatomic characteristics are fairly constant. However, since the book discusses also the detection of adulteration and diagnosis of mixtures, one misses the mentioning of new adulterants as well as that of improved methods of detection which have been reported in recent literature. It is noted further that the authors are still of the same opinion concerning quantitative microscopic analysis as that expressed in the first edition: "By microscopic analysis we learn the ingredients, but gain little idea of their proportion." Excellent work has been done in late years on quantitative microscopic analysis, and it might have been well to mention those results, which undoubtedly must be known to the authors. No mention has been made of the occurrence and nature of common molds and means for their detection in vegetable products. Figure 250, referred to in the discussion of agar agar as showing a number of diatoms, does not represent those which are commonly found in agar agar and which are considered characteristic of this product. The chapter on apparatus could well have been considerably extended, so as to include the comparison microscope, an easy means, especially for the untrained analyst, to compare two different objects microscopically at the same time. The fluorescence microscope as a means for the detection of cocoa shells in cocoa powder or ergot in flour might also have been mentioned. A more complete discussion of microchemical means for the detection and identification of either characteristic plant tissues or bodies in the tissue would have been of great help to the analyst in some of his difficult problems. A reference to the progress of microsublimation would probably have been in place, since this is often an easy and quick means to identify certain drugs or to detect extracted vegetable products, for example, tea freed from caffein by extraction.

The foregoing suggestions have been made with the desire that they might be considered by the authors in a future edition. The present edition is undoubtedly the best book on the subject in the English language.

Medicolegal

Liability of Physician for Injury to Nurse While Taking Her to Case

(Loftus vs. Pelletier (Mass.) 111 N. E. R. 712)

The Supreme Judicial Court of Massachusetts sustains exceptions to a verdict ordered for the defendant, and holds that, in accordance with a stipulation of the parties, judgment in the sum of $1,600 must be entered for the plaintiff. The court says that the plaintiff, a district nurse, was hired and paid by a women's club to attend patients who could not afford a nurse, when called on to do so by the physician in charge of such a patient. She testified that it was "a common thing for the different doctors to take you to their cases when they were making their calls" when the patient was so far out of town as the patient was to whom the defendant was taking her in his automobile when she was injured. The patient "was over 2 miles from town." The defendant testified that: "It was her (the plaintiff's) duty to go with me on my request." Unfortunately, in this instance, the automobile skidded and turned over, the plaintiff being thrown over the wind shield and injured. The mere fact of the car's skidding is not considered evidence of negligence, but it is held that, under all of the circumstances of the case, it was a question for the jury whether the skidding was not caused by the defendant's negligence in driving at a speed of more than 30 miles an hour in going around a sharp curve when the crowned surface of the road was loose and wet. The defendant's main defense, however, was that the plaintiff and he (the district nurse and the physician) were engaged in a common enterprise, and that since it has been held that those engaged in a common enterprise are both liable for an accident caused in the carrying out of that enterprise, and that the contributory negligence of one in such a case is to be imputed to the other or others engaged in it, it follows that one of those engaged in the enterprise cannot sue another of them if the one was injured through the negligence of the other. But the court does not find it necessary to consider whether it could have been found that the plaintiff and the defendant were engaged in a common enterprise, or whether, if they were, the defendant's contention that neither one could sue the other was well founded. The question to be decided was whether it had to be ruled as matter of law that the relation between the plaintiff and the defendant was that of persons engaged in a common enterprise, and the court holds that it could not have been so ruled. Furthermore, the two pieces of testimony by the plaintiff and the defendant, taken together, warranted a finding that a right to be transported to the patient was an implied term of the plaintiff's contract of employment when the patient lived some 2 miles out of town, and that under that contract the plaintiff was bound to accept the defendant's automobile as the method of that transportation when it was offered to her. From these findings it followed, or at least could have been inferred, that at the time of the accident the plaintiff was being carried under her contract of employment, that is to say, that she was being carried by the defendant for hire.

Upholds Requirement of Extra Heavy Plumbing Material

(Kleinhein vs. Board of Commissioners of City of Wichita et al. (Kan.), 157 Pac. R. 1190)

The Supreme Court of Kansas affirms a judgment in favor of the defendants in this action to restrain the board of commissioners from enforcing a city ordinance requiring waste pipes and fittings and all plumbing brass goods to be extra heavy, no goods of light weight or cast from yellow brass and known to the trade as competition goods to be used. This ordinance was passed pursuant to authority contained in a state statute providing that each city with a population of 7,000 or more having a system of water supply or sewerage shall prescribe rules and regulations for the materials, construction and inspection of all plumbing and sewerage, and the

board of health or proper authorities shall further provide that no plumbing work shall be done, except in case of repairing leaks, without a permit first being issued therefor on such terms and conditions as the city shall prescribe. The court briefly summarizes the evidence for and against the reasonableness of the ordinance. It says that extra grade plumbing goods are all heavier than those designated as "standard" and are all more expensive. Extra grade brass fixtures are cast from "red brass," or brass in which the copper constituent largely preponderates over the zinc. "Yellow brass" fixtures are made of drawn or rolled brass, the seams being brazed by electricity. In yellow brass the zinc constituent largely preponderates over the copper. Competition goods are simply goods sold in competition with those of extra grade. There was evidence that standard goods stand the tests of initial inspection as well as those of extra grade, are quite as durable as those of extra grade, and consequently are just as sanitary. The advantage in their use is that the builder who must build modestly can do so with satisfaction to himself and safety to the public and at a considerable saving in costs. There was also some evidence tending to show that independent plumbers are not able to procure extra grade material on equal terms with members of the association of master plumbers. Touching the merits of the case, the court's own remarks are few. It says that the plaintiff's claims are supported by high medical authority, and quotes an editorial from THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, Aug. 29, 1914, p. 784. Then it adds that it is just possible that the foregoing views are those of a bacteriologist who is biased somewhat by his specialty and that effective plumbing may produce effects deleterious to health beyond those described. However this may be, the court has here a subject open to debate which has been duly considered by the legislature and by the city commissioners, and this court cannot declare as a matter of fact that the statute has no direct or substantial relation to the public health and welfare. This being true, the statute is valid. The ordinance obeys the mandate of the statute, and, so far as the court can see, does no more than carry out the intention of the legislature. This being true, the court cannot set aside the ordinance.

Surgeon Present at Interview Between Others a Competent Witness

(C. H. & D. Ry. Co. vs. Gross (Ind.), 111 N. E. R. 653)

The Appellate Court of Indiana, Division No. 2, says that a surgeon who was called as a witness in this personal injury case had been in the service of the defendant company for several years. He selected other surgeons to treat the injuries of plaintiff Gross, and gave them, and also nurses general directions to that end, and also occasionally called on the plaintiff personally after he was injured and prescribed for him. Several days after the plaintiff was injured, certain representatives of the defendant company, under arrangements made with and by this surgeon, had an interview with the plaintiff in the reception room of the hospital in which he was a patient for the purpose of ascertaining from him the facts respecting the collision of the trains, and the circumstances under which he was injured. The surgeon went with the company's representatives to the interview, and was present for the double purpose that the representatives might be permitted to talk with the plaintiff, and to see that he was properly cared for while being removed from his ward to the reception room. Although present at the interview, the surgeon did not participate in it. At the trial, the company sought to show by the surgeon what the plaintiff said to its representatives in narrating the events preceding and attending the collision. On objection that the matter was privileged, the trial court excluded the testimony. It did not appear that the surgeon was present on that occasion for the purpose of or preparatory to treating the plaintiff for his injuries, or for any other ailment, or that the information was sought or needful to that end. In fact, it affirmatively appeared that the interview was of an entirely different nature, and for purposes other than those related to the plaintiff's treatment as a patient. Under such circumstances, the evidence should have been heard.

Miscellany

CONFERENCE OF STATE HEALTH OFFICERS WITH UNITED STATES PUBLIC HEALTH SERVICE, ON POLIOMYELITIS

On the call of the surgeon-general of the United States Public Health Service, representatives of thirty-nine states and of the District of Columbia met in Washington, August 17 and 18, to see what could be done toward establishing uniformity with respect to the quarantine restrictions imposed and to be imposed on persons suffering from acute anterior poliomyelitis, persons exposed to that disease, and persons coming from localities in which the disease is prevalent. Representatives of ten railroad companies, one insurance company, and of seven cities were present as guests of the conference.

In discussing the symptomatology of poliomyelitis, Dr. George Draper of New York expressed the opinion that any quarantine based solely on the cases of the disease that show paralysis is without value. The disease is not essentially a paralytic disease, and during the prevalence of the malady every sick child should be presumed to be suffering from poliomyelitis until the contrary is proved. Particular importance is to be attached in the diagnosis of the disease to pain on anterior flexion of the spine. The child tries to avoid any motion or manipulation involving such flexion, and shows evidence of being hurt if it is insisted on.

Dr. C. H. Lavinder of the Public Health Service, in charge of the epidemiologic work of the service in New York, said that in addition to the work incident to such investigations an entomologic survey of the infected area is being made, and paralytic phenomena in animals are being studied. Dr. Lavinder called attention to the importance of uniformity in the methods employed by state health officers and other agencies engaged in the epidemiologic study of this disease, and the conference later adopted certain standard forms which it recommended for this purpose.

Dr. G. W. McCoy, director of the Hygienic Laboratory, Public Health Service, reported that special studies are under way to determine the nature of the paralytic phenomena so often reported as prevailing among domestic animals during outbreaks of poliomyelitis, to determine the susceptibility of domestic animals to poliomyelitis as it occurs in man, and to find, if possible, some method whereby early diagnosis will be facilitated.

Dr. Haven Emerson, commissioner of health, New York City, said that in order to determine whether there is any relation between poliomyelitis and the milk supply, and if so what that relation is, an intensive study is being carried on, correlating from all possible standpoints the facts pertaining to the cases in one borough with the facts pertaining to the milk consumed in that borough. An effort is being made to determine whether there is any distinct type of child that is more apt to be attacked than children of other types. The results of different modes of treatment are being studied. Under the direction of Dr. A. H. Doty, and through funds provided by the Rockefeller Foundation, all discoverable exposures to infection and contact cases are being investigated by a corps of physicians and nurses employed for that purpose. The occurrence of secondary cases in households infected by poliomyelitis has thus far been found to be about as frequent as the occurrence of similar cases in scarlet fever.

Dr. Emerson said that the most important measures looking toward the prevention of the spread of poliomyelitis were immediate reporting, prompt diagnosis, and hospitalization. Patients should be put under fly screens as soon as possible. The movements of children should be restricted, and massing of them in parades, on picnics, at the movies, etc., should be avoided. The interest excited by the presence of the disease should be seized on for the more general and effective enforcement of sanitary regulations. New York regulations recognize the incubation period of poliomyelitis as two weeks, and regard the patient as infective for four weeks. Some New York physicians are personally using cleansing nasal sprays, say of normal salt solution, as a routine part of their

toilet on leaving hospital wards where there are poliomyelitis patients. Leading pediatricians, however, have advised against any effort to popularize the procedure, on the ground that possible traumatism from its use in unskilled hands and the likelihood of the use of the same atomizer or other apparatus by several persons would constitute a danger that would more than offset the possible good. No case of poliomyelitis has been traced to any physician or nurse. No relation has been discovered between the removal of tonsils and adenoids and the occurrence of poliomyelitis, but it was advised that no such operations be done during the prevalence of the disease, lest dangerous portals for possible infection be thereby opened and the patient be made more susceptible to infection by the loss of blood and the weakness incident to the operation.

Dr. Wade H. Frost of the Public Health Service, who is now engaged in epidemiologic work in New York, called attention to the fact that there is no known cultural method of identifying the organism that causes poliomyelitis. It can be recognized only through animal experimentation. Monkeys can be infected by the introduction of the virus into the nasal chambers even though no great traumatism be done to the mucous membrane, or by direct inoculation. Such methods are, however, too slow to be of much practical value in the recognition of the disease for the purpose of treatment or of quarantine, and they are not available to the average physician or health officer. So far as Dr. Frost knew there was no recorded case of the accidental dissemination of poliomyelitis among the monkeys in any animal house connected with any bacteriologic laboratory, even though infected animals were present, and no special precautions were taken to prevent the spread of the disease to the other monkeys, some of which might be demonstrated by subsequent inoculation experiments to be susceptible. He knew of no case in which an attendant at such an animal house had contracted poliomyelitis from infected monkeys or had been suspected of having carried the disease to others.

According to Dr. Frost, in the epidemiologic study of an outbreak of poliomyelitis there were ordinarily from 75 to 90 per cent. of the recognized cases that could not be traced to any preexisting case, the variations between the extremes stated depending on the character of the evidence that the investigator demanded as proof of such exposure. Among persons known to have been exposed, the incidence is relatively small. In view of the widespread dissemination of poliomyelitis without known exposure, a large number of carriers must exist if the disease is limited to the human race. Insect carriers have not, however, been absolutely excluded. Possibly the disease exists among domestic animals, or at least some disease that is due to the same virus, and is spread by direct contact, as with cats and dogs, or by dust or insects; but if this is the case, the disease as it prevails among such animals cannot be ordinarily of a paralytic type.

Dr. Ernest C. Levy, health officer, Richmond, Va., suggested that the endemic form of poliomyelitis might depend on some cause other than that which is responsible for outbreaks of the disease such as that now prevailing, and urged that studies be made to determine whether such is or is not the case.

Uniformity of procedure looking toward the prevention of the spread of poliomyelitis from state to state, and from one community to another within the same state, was recommended by the conference, along the following lines:

Quarantine by one state against another state, or by one community against another community within the same state, was disapproved, on the ground that the federal government, through the United States Public Health Service, can perform all the duties necessary in interstate relations, and that the state can perform like functions with respect to quarantine between communities within its own borders.

All cases of poliomyelitis should be reported immediately to the local health authorities and to the health authorities of the state, and the latter should make weekly reports to the United States Public Health Service. The Public Health Service should issue each week a summary of the reports received.

A state health authority, believing its territory to be in danger of invasion by poliomyelitis from another state, should call the attention of the United States Public Health Service to the situation, which should thereupon investigate the supposedly dangerous area. Should any area be found to constitute a menace to interstate travel, the Public Health Service should define that area, and thereafter the general restrictive measures laid down for the prevention of the spread of the disease should be in force with respect to it. Before any person 16 years old or less may leave the restricted area he should provide himself with a health certificate and permit to travel, and notice should be sent by the authority by which such certificate and permit are issued to the state health authority of the state of destination. Such health certificates and travel permits should be based on medical inspection and be void unless the journey begins within twenty-four hours after the issue of the permit. It is recommended that they be issued without fee. They must be signed by an officer of the United States Public Health Service, by the state health officer, or by a person empowered by the state health authority so to do.

A person 16 years of age or less who removes from an infected area to another locality should be kept under medical observation daily for two weeks from the date of his health certificate and travel permit.

Common carriers should instruct their agents and ticket sellers, when poliomyelitis is unusually prevalent, that travelers with children 16 years of age or less must be provided with health certificates and travel permits.

For the local control of poliomyelitis, the conference defined certain minimum requirements. Every known or suspected case of the disease should be immediately reported to the local health authority, and if poliomyelitis exists the premises are to be placarded. The minimum quarantine period for the patient is six weeks, and even after quarantine is raised he is to be excluded from schools and all public gatherings for two weeks more. Any person continuing to reside on the infected premises must remain there until quarantine has been raised, but with the permission of the health officer and after disinfection of person and clothing he may remove therefrom. Permission for the removal of children from the infected premises is to be granted, however, only when they are going to premises on which none but adults reside. Children so removing must be confined on the premises, in the house, for two weeks from the date of their arrival, and must be kept under observation by the health authorities.

Children, and teachers and other persons employed in or about a school building, who have been exposed to poliomyelitis, are to be excluded from the building and grounds for two weeks following the last exposure, and until after disinfection of persons and clothing. Whenever schools are closed on account of an outbreak of poliomyelitis, children under 16 years of age must be confined on their own premises.

If poliomyelitis occurs on premises in which foodstuffs are handled in the course of trade, the removal of such foodstuffs from the infected premises is to be prohibited until after quarantine has been raised; and the premises and their contents, and all utensils connected with the business, have been disinfected.

No article whatsoever is to be taken from the infected premises during the period of quarantine. Carpets, rugs, curtains, bedding and similar articles from the infected premises are not to be exposed to the open air for airing, sunning, shaking or beating, without the express approval of the health officer. Library and school books must be burned. Domestic animals which have been in contact with the patient must be subjected to a thorough disinfecting bath before removal from the infected building or apartment, and must thereafter be confined in an outbuilding.

The usual provisions for the screening of the sickroom and the disinfection of articles exposed to infection and of excreta are to be followed.

The conference recommended that, whenever poliomyelitis is unusually prevalent, assemblages of children in public places be prohibited and that schools be opened only after

thorough medical supervision by a health authority. When schools have been closed and are to be reopened, beginning should be made with the high schools, and the schools for the lower age groups should be opened only as provision can be made for complete medical examinations. Measures to prevent the dissemination of human excreta and other bodily discharges and contamination by them, the suppression of flies, the prohibition of the common drinking cup, and a general educational campaign for cleanliness, with particular instruction of parents and children concerning personal hygiene, especially of the mouth and nose, were recommended by the conference.

The epidemic prevalence of poliomyelitis in certain states now was accepted by the conference as an indication of the likelihood of epidemic prevalence next year in states not gravely affected at the present time, and it was recommended that the preventive measures endorsed by the conference be continued in force at least until the incidence of the disease has subsided to or below its usual level.

Society Proceedings

COMING MEETINGS

Am. Assn. for the Study and Prev. of Inf. Mort., Milwaukee, Oct. 19-21.
American Association of Railway Surgeons, Chicago, Oct. 17-19.
American Roentgen Ray Society, Chicago, Sept. 27-30.
Colorado State Medical Society, Glenwood Springs, Sept. 5-7.
Idaho State Medical Association, Twin Falls, Oct. 5-6.
Indiana State Medical Association, Ft. Wayne, Sept. 27-29.
Minnesota State Medical Association, Minneapolis, Oct. 11-13.
Missouri Valley Medical Society, Omaha, Sept. 21-22.
Oregon State Medical Association, Portland, Sept. 14-15.
Pennsylvania State Medical Society, Scranton, Sept. 18-21.
Utah State Medical Association, Salt Lake City, Sept. 12-13.
Wisconsin State Medical Society, Madison, Oct. 4-6.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Insanity, Baltimore

July, LXXIII, No. 1

1 Psychiatry and Its Opportunities. E. N. Brush, Baltimore.—p. 1.
2 Stage Mad-Folk in Shakespeare's Day. P. Butler, New Orleans. p. 19.
3 Intellectual Efficiency in Relation to Insanity. A. J. Rosanoff, Kings Park, N. Y.—p. 43.
4 Psychiatric Needs of Large Community. O. Copp, Philadelphia. —p. 79.
5 Some Considerations of General Paresis from Histologic Standpoint. S. T. Orton, Philadelphia.—p. 89.

American Journal of Medical Sciences, Philadelphia

August, CLII, No. 2

6 *Coincidence of Latent Syphilis and Diabetes. A. S. Warthin and U. F. Wilson, Ann Arbor, Mich.—p. 157.
7 Dermoids of Mediastinum: Report of Cases. A. E. Hertzler, Kansas City, Mo.—p. 165.
8 *Relief of Chronic Obstructive Jaundice by Palliative Operations. J. F. Erdmann and C. G. Heyd, New York.—p. 174.
9 *Wassermann Reaction in Its Relation to Tuberculosis. C. G. Snow and A. T. Cooper, U. S. Army.—p. 185.
10 Care of Subacute Yellow Atrophy of Liver. A. Fraser, New York.—p. 202.
11 *Aneurysm of Thoracic Aorta; Its Incidence, Diagnosis and Prognosis. I. I. Lemann, New Orleans.—p. 210.
12 *Unusual Case of So-Called Pseudoleukemia (Lymphosarcoma). L. M. Warfield and H. T. Kristjanson, Milwaukee, Wis.—p. 222.
13 Case of Mediastinal Leukosarcomatosis (Sternberg). F. P. Weber and F. Wolf, London.—p. 231.
14 *Acute Myeloblastic Leukemia in Its Relation to Primary Anemia; Report of Case. S. W. Sappington, Philadelphia.—p. 238.
15 Nature of Bactericidal Property of Vaginal Secretion. T. Harada. —p. 243.
16 Calcium and Magnesium Metabolism in Case of Chronic Gout. J. Rosenbloom, Pittsburgh.—p. 256.
17 Case of Chronic Family Jaundice. I. H. Levy and J. L. Kantor, Syracuse.—p. 258.
18 Autoserobacterins. M. G. Wohl, Omaha.—p. 262.

6. **Coincidence of Syphilis and Diabetes.**—Six cases cited by Warthin and Wilson show that a combined interlobular and interacinar type of pancreatitis with loss of the islands of Langerhans is extremely frequently associated with old latent syphilis. In the great majority of cases the pancreatitis is localized and patchy in character, and more rarely severe and diffuse. Diabetes may be associated with the more marked degrees of syphilitic pancreatitis; and in their necropsy service all of the diabetes cases have been so associated; but a number of cases of syphilitic pancreatitis of similar degree of severity have not presented the clinical symptoms of diabetes. It seems very probable therefore, that latent syphilis is the chief factor in the production of the form of pancreatitis most frequently associated with diabetes, but that diabetes is not always coincident with severe degrees of this type of pancreatitis.

8. **Chronic Obstructive Jaundice Relieved by Palliative Operations.**—The cases cited by Erdmann and Heyd may be epitomized as follows: 1. Carcinoma of the duodenum and papilla of Vater; cholecystostomy and posterior gastro-enterostomy; secondary operation; cholecystojejunostomy; recovery. 2. Carcinoma of the duodenum, with biliary obstruction; transfusion; posterior gastro-enterostomy and cholecystogastrostomy; recovery. 3. Carcinoma of the common duct; cholecystogastrostomy; death. 4. Carcinoma of the pancreas; hepaticoduodenostomy; death. 5. Carcinoma of pancreas; cholecystocolostomy; recovery. 6. Carcinoma of pancreas and ampulla of Vater; posterior gastro-enterostomy; cholecystostomy; recovery, secondary cholecystocolostomy; death. 7. Carcinoma of pancreas; hydrops of gallbladder; cholecystostomy; choledochostomy; death. The authors maintain that all cases of obstructive jaundice are entitled to operative consideration. There is a certain definite percentage of cases that are cured because there has been a mistake in the diagnosis. The immediate relief from itching, in addition to the prolongation of life, is an exceptionally strong argument for operation.

9. **Wassermann Reaction in Tuberculosis.**—As a result of their examination of 200 tuberculous patients, Snow and Cooper are firmly convinced that tuberculosis need not, in the absence of syphilis, present a positive Wassermann reaction. The percentage of nonsyphilitic, tuberculous patients whose blood may bind complement with noncholesterinized antigens is so small as to be practically negligible. Complete fixation, namely, a strong Wassermann reaction with noncholesterinized antigen, in a tuberculous patient, is as adequate presumptive evidence of syphilis as it is in a non-tuberculous. The serums of nonsyphilitic tuberculous patients may give partial to complete complement fixation with cholesterinized antigen in about 31 per cent. of cases.

11. **Aneurysm of Thoracic Aorta.**—Lemann emphasizes the fact that if we wait for the complete classical clinical picture of thoracic aneurysm as described in our textbooks, we shall miss the vast majority of cases in which the prognosis of the disease is such as to preclude any aid to the patient. Only two phenomena were present in any considerable percentage of the cases, pain and dulness. The pain may be substernal, vertebral, may extend down either arm or up the side of the neck to the occiput. The pain may be continuous or may occur as typical attacks of angina. Percussion seems to yield earlier information of an intrathoracic growth than any other method of physical examination. The dulness in Lemann's cases was always outspoken and required no particular method nor manipulation to demonstrate. It was so often the first and only phenomenon to direct attention to intrathoracic abnormality that he is convinced that if more attention is paid to it in routine physical examinations many "latent" aneurysms will be turned to light. The abnormal dulness to which attention is called may be found in two locations. The first in the region of the manubrium.

When an abnormality in the anterior mediastinum exists, the area of relative dulness is converted into one of flatness, and the conditions are reversed so that instead of the manubrium being more resonant than the body of the sternum it is duller. In addition to this the limits of the flatness (or dulness) are no longer marked by the sternal border, but extend more or less into the first and second intercostal spaces, according to the size and location of the abnormal solid mass in the mediastinum. The second location of

abnormal dulness is over the vertebrae. Under normal conditions, percussion over the thoracic spine yields a resonant note except over the bodies of the first, second and sometimes the third vertebrae. These are dull. In cases in which dulness extends lower than the body of the third thoracic vertebra there exists some abnormality in the posterior mediastinum. Added significance is lent to this vertebral dulness when there is also paravertebral dulness whether on the one side or the other, but particularly on the left side.

12. **So-Called Pseudoleukemia.**—The case cited by Warfield and Kristjanson was unusual in that it appeared to be typical lymphosarcoma on first admission. On readmission, the blood picture was that of acute lymphatic leukemia and glands removed from the axilla just before death showed a picture indistinguishable from the appearance which the authors believe is typical of Hodgkin's disease.

14. **Acute Myeloblastic Leukemia.**—Sappington cites a case of grave anemia which presented in the last eight days of life a blood picture of acute myeloblastic leukemia with extraordinary numbers of nucleated red cells.

American Journal of Orthopedic Surgery, Boston

August, XIV, No. 8

19 Opportunity for Orthopedist in Preventive Medicine Through Educational Work on Posture. J. E. Goldthwait, Boston.—p. 443.
20 *Treatment of Caries of Spine by Bone Transplants; Report of Twenty-Three Cases. R. L. John, Philadelphia.—p. 450.
21 *Obstetric Paralysis. Orthopedic Problem. J. W. Sever, Boston. p. 456.
22 Presence of Roentgenologic Shadows Associated with Subdeltoid Bursitis; Presence of Similar Shadows in Other Parts of Body. J. M. Berry, Albany, N. Y.—p. 476.
23 Certain Aspects of Injuries of Lower Back. R. Hammond, Providence, R. I.—p. 484.

20. **Treatment of Caries of Spine by Bone Transplants.**—In the twenty-three cases reported by John an excellent result was obtained in seven cases, moderately good in three cases, poor in one case, indifferent as to operation in eight cases, one patient died as result of operation and not traced or too recent to consider in three cases. Of the six patients who died under treatment, one patient died of acute miliary tuberculosis in forty days after operation; one, of ether pneumonia, in forty hours after operation; three patients died of tuberculous meningitis in seventeen days, two months and three months, respectively; and one case of secondary sinus infection twenty-six months after operation. John points out that the danger of arousing and disseminating a more or less latent infection by the trauma of the operation is more grave than has been generally conceded. Even in those cases in which the operation has been most successful in ankylosing the vertebrae, the good results in several instances have been only local, the disease soon appearing in a new focus. In other words, the disease is arrested locally, but not generally.

21. **Obstetric Paralysis.**—By numerous dissections on infantile cadavers Sever has shown that traction and forcible separation of the head and shoulder puts the upper cords, the fifth and sixth cervical roots of the brachial plexus under dangerous tension. Any sudden force applied with the head bent to the side and the shoulder held, would injure these cords. Further observation shows that forcible abduction and elevation of the arm and shoulder put the lower cords of the plexus, the eighth cervical and first thoracic, on a stretch, and when much force is applied it may lead to a tear, rupture or other injury to these segments. This condition is seen in breech cases, with arm extended. It may also follow sudden strain when the arm is elevated, such as the so-called "hostler's paralysis," caused by the sudden elevation and strain of the arm, which occurs when a hostler holds a rearing horse. With the shoulder held and the head carried to one side, with the clavicle intact, considerable force was necessary to injure the plexus. The suprascapular nerve always snapped first, apparently for the reason that it had not so much freedom of play as the others. Even with considerable force, the fifth and sixth nerves could not be completely torn across at Erb's joint, but frayed out inside the sheath, following a partial tearing or rupture of the sheath, which always gave way first. In some cases there could be produced an evulsion from the spinal cord of the fifth and sixth roots. The upper arm type of paralysis is much more frequent than the lower arm type. The prognosis for a useful arm is good in the upper arm type and bad in the lower arm type.

Bulletin of Johns Hopkins Hospital, Baltimore

August, XXVII, No. 306

24 *Value of Roentgen-Ray Examinations in Diagnosis of Cancer of Stomach. F. H. Baetjer and J. Friedenwald, Baltimore.—p. 221.
25 Seventy Cases of Brain Tumor. G. J. Heuer and W. E. Dandy, Baltimore.—p. 224.
26 *Experimental Tuberculous Meningitis. C. R. Austrian, Baltimore. —p. 237.
27 *Alcohol Injection Treatment for Pruritus Ani. H. B. Stone, Baltimore.—p. 242.

24. **Roentgen-Ray Study of Cancer of Stomach.**—Baetjer and Friedenwald selected fifty consecutive cases, including those only concerning which they could feel confident of the correctness of the diagnosis. Of these, the growth was located in thirty-four instances about the pylorus, in nine it involved the body of the stomach without interfering with the orifices, and in seven the cardia was involved. Of the fifty cases, the gastric secretion was obtained in forty-six. There was a normal acidity in four instances; a hypochlorhydria or an absence of acid in thirty-six instances, and a hyperchlorhydria in six instances. In the thirty-six cases showing a hypochlorhydria, lactic acid was present in twenty-eight instances, and the Oppler-Boas bacillus in twenty-four. Occult blood was present in the stools in forty-two of all the cases. A palpable tumor was observed in thirty-four; dysphagia in seven; pain was present in forty-nine; vomiting in forty-four; gastric hemorrhage in fourteen; melena in eight; occult blood in forty-six; dilatation of the stomach in twenty-four cases. The Roentgen ray gave positive evidence of disease in forty-six instances, of which four were early cases and forty-two were late cases. In two of the four early cases the roentgenogram gave a positive diagnosis of carcinoma. In the other two, however, an ulcerative lesion was found which was thought to be benign. The Roentgen-ray evidence, then, was positive in forty-two of the late cases. It was positive, so far as the lesion was concerned, in all of the cases, but positive in only 95 per cent. of the cases as regards the actual diagnosis of carcinoma. In the early cases the Roentgen ray showed a lesion in all; in two of them, however, it was thought to be benign, but exploration proved the condition malignant. This method of examination, in the authors' experience, possesses about the same diagnostic value as any of the other early signs of this disease, when taken alone, but in conjunction with the clinical evidence a positive diagnosis can almost always be made.

26. **Experimental Tuberculous Meningitis.**—Thirty-five rabbits were utilized by Austrian in making his observations. Twenty received inoculations of the bovine type of tubercle bacilli, and fifteen were injected with bacilli of the human type. The growth of a culture two weeks old was suspended in 0.85 per cent. salt solution. The resulting suspension was then diluted with salt solution to the approximate density of a 0.05 per cent. solution of lecithin in 0.85 per cent. salt solution. From 1.0 to 1.5 c.c. of such a suspension were slowly injected with very little pressure into the spinal canal, either through a needle inserted into the canal in the lower lumbar region, or into the cranial cavity according to the procedure of Manwaring. These experiments demonstrated that the injection of tubercle bacilli into the spinal canal of rabbits caused the development of meningitis. The clinical syndrome produced was definite, and the symptoms were typically those of meningeal inflammation. The signs most constantly noted were dulness and coma, or restlessness, excitability and hyperesthesia to touch and light, anisocoria, paralyses, muscular hypertonicity, even opisthotonos. It is suggested that the ready production of meningitis in rabbits by the intraspinous injection of infectious material might be used to identify the nature of a meningeal infection in man. It would be a simple procedure to introduce into the spinal canal of a rabbit 1.0 to 2.0 c.c. of the spinal fluid of a patient thought to have tuberculous meningitis, and in a few days examina-

tion of the rabbit's meninges might give evidence of the tuberculous nature of the patient's disease.

27. **Alcohol Injection Treatment for Pruritus Ani.**—The success of alcohol injections for producing localized lasting anesthesia, in facial and other forms of neuralgia, suggested to Stone the application of the same principle to the abolition of unpleasant sensations from the anal and perianal regions. The method has been tried in seventeen cases. There is not much pain associated with the injection. There is some soreness during the first twenty-four hours, after which the only subjective sensation remarked is numbness. The itching is immediately abolished and the area injected is largely or completely anesthetic. No case so far has shown the slightest evidence of disturbance in the action of the sphincter. One patient has returned for a second injection, eight months after the first, for a recurrence of itching. The area in which the itching is complained of is carefully noted. Under general or local anesthesia, the injection is then made so that this whole area is anesthetized. The needle is carried entirely through the skin vertically and then is inclined sharply to the side so that it lies nearly parallel to the skin surface. This method accomplishes practically the same thing as the operative treatment for pruritus, and is indicated in those cases of great intensity in which the usual measures have failed.

Illinois Medical Journal, Chicago

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28 Medical Legislation — Recent and Contemplated. C. S. Drake, Springfield.—p. 81.
29 Surgery of Colon As Applied to Intestinal Stasis. A. J. Ochsner, Chicago.—p. 86.
30 Traumatic Hernia, So-Called. C. W. Hopkins, Chicago.—p. 89.
31 Appendicitis From Standpoint of Ordinary Surgeon. C. A. Buswell, Chicago.—p. 94.
32 Chronic Appendicitis From Standpoint of Internist. J. C. Friedman, Chicago.—p. 100.
33 Surgery From Patient's Viewpoint. C. U. Collins, Peoria.—p. 105.
34 Atypical Form of Splenic Disease. A. B. Kanavel, Chicago.—p. 110.
35 Splenectomy in Pernicious Anemia. P. M. Parrish, Decatur.—p. 112.
36 Splenectomy. M. L. Goodkind, Chicago.—p. 115.
37 Id. N. M. Percy, Chicago.—p. 118.
38 Preparation and Use of Vaccines in Chronic Bacterial Localizations. A. Gehrmann, Chicago.—p. 120.
39 Radium Therapy. F. E. Simpson, Chicago.—p. 123.
40 Clinical Significance of Vicarious Gastrorrhagia. F. Smithies and R. Bowen, Chicago.—p. 126.
41 Malignant Endocarditis. A. H. Baugher, Chicago.—p. 132.
42 Management of Empyema in Childhood. A. M. Miller, Danville.—p. 138.
43 Interpretation of Roentgenograms. F. S. O'Hara, Springfield.—p. 140.

Journal of Cutaneous Diseases, Boston

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44 Dermatologist, Proper Teacher of Syphilis. J. Zeisler, Chicago.—p. 583.
45 Congenital and Bone Syphilis. A. Post, Boston.—p. 589.
46 Paastes. D. W. Montgomery, San Francisco.—p. 596.
47 Case of Nevus Anemicus. J. E. Lane, New Haven, Conn.—p. 602.
48 Argyria From Unusual Source. A. Davidson, Los Angeles.—p. 605.

Medical Record, New York

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49 Cultivation of the Organisms of Vaccinia, Variola, and Varicella. H. Greeley, Brooklyn.—p. 265.
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52 Vaccines in Acute Infection. E. Bonime, New York.—p. 282.
53 History of Condensed Milk, With a Note on Its Therapeutical Uses. P. Batholow, New York.—p. 284.
54 Probable Future Evolution of Insurance Medicine. H. E. MacDonald, Los Angeles.—p. 286.

Michigan State Medical Society Journal, Grand Rapids

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58 Therapeutic Application of Ovarian Extract. W. H. Morley, Detroit.—p. 372.
59 Sinusitis — Acute and Chronic. L. J. Goux, Detroit.—p. 377.
60 Plea for Larger Surgical Instinct in Obstetrics. E. T. Abrams, Dollar Bay.—p. 381.
61 Demonstration of Case of Phagadena. U. J. Wile, Ann Arbor.—p. 386.
62 Case of Constitutional Syphilis Associated with Hallucinatory Mental States. A. L. Jacoby, Ann Arbor.—p. 388.
63 Case of Multiple Pregnancy with Eclampsia; Abdominal Cesarean Section with Recovery. R. A. Bartholomew, Ann Arbor.—p. 390.
64 Tendency of Diphtheria Bacillus to Localize in Upper Respiratory Tract and Importance of This Fact in Routine Culture Work. D. O. Walthall, Ann Arbor.—p. 392.
65 Lantern Slide Demonstration of Month's Roentgenograms. J. G. Van Zwaluwenburg, Ann Arbor.—p. 395.

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67 Paracutic Deafness and Treatment. W. M. Reed, Kansas City.—p. 372.
68 Mental Clinic and Social Service in Care of Insane in Their Homes. F. M. Barnes, Jr., St. Louis.—p. 374.
69 Function of Observation Ward at City Hospital. M. A. Bliss, St. Louis.—p. 377.
70 Hospital for Insane and Mental Hygiene of Community. G. A. Johns, St. Louis.—p. 379.
71 Conservatism in Surgery of Female Pelvis. C. L. Cooper, Kansas City.—p. 381.
72 Care of Delicate Infant During Hot Weather. J. M. Brady, St. Louis.—p. 383.
73 Necessity for Studying Medical History. R. E. Schlueter, St. Louis.—p. 385.
74 Fetal vs. Maternal Impression. A. G. Pohlman, St. Louis.—p. 391.

New York Medical Journal, New York

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77 Our American Voice and Articulation. C. P. Grayson, Philadelphia.—p. 298.
78 Vincent's Bacillus in the Cervix. Guthrie McConnell, Waterloo, Ia.—p. 300.
79 Health Insurance From the Viewpoint of a Physician. A. C. Burnham, New York.—p. 301.
80 Modern Methods of Transfusion. L. M. Kahn, New York.—p. 304.
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82 Gonorrhea and Its Complications. Treatment With the Atoxic Antigonococcus Vaccine of Nicolle and Blaizot. A. Hyman, New York.—p. 308.

Ophthalmic Record, Chicago

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83 Chronic Infection of Faucial Tonsils as Causative Factor in Production of Paralysis of Accommodation; Report of Two Cases. C. A. Veasey, Spokane, Wash.—p. 379.
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85 Keratitis Associated with Rental Caries; Report of Cases. H. W. Blum, New Orleans.—p. 389.
86 New Muscle Substitution Operation for Congenital Palpebral Ptosis. J. B. Roberts, Philadelphia.—p. 397.
87 Trephining in Buphthalmos; Disappointment. H. Gifford, Omaha.—p. 402.
88 Tubular Vision; Its Underlying Causes. L. D. Brose, Evansville, Ind.—p. 403.
89 Improved Elliot Operation for Glaucoma. J. G. Huizinga, Grand Rapids, Mich.—p. 410.
90 Explosion of Snellen Eyes. A. Rochester, Chicago.—p. 412.

Southern Medical Journal, Birmingham

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91 *Study of Spartein Sulphate. W. H. Zeigler, Charleston, S. C.—p. 671.
92 *Clinical Value of Various Digitalis Drugs and Preparations. J. T. Halsey, New Orleans.—p. 677.
93 Bowel Fluxes of Babies. I. L. Van Zandt, Fort Worth, Texas.—p. 679.
94 Fractional Method of Gastric Analysis. D. VanderHoff, Richmond, Va.—p. 683.
95 Artificial Pneumothorax. J. J. Lloyd, Catawaba Sanatorium, Va.—p. 685.
96 Application of Artificial Pneumothorax in Treatment of Pulmonary Tuberculosis. M. F. Sloan, Towson, Md.—p. 689.
97 District Tuberculosis Nursing Plan in Florida. J. Y. Porter, Jacksonville, Fla.—p. 699.
98 Real Value of Climate. C. M. Hendricks, El Paso, Texas.—p. 703.
99 *Some of Problems in Public Health Education. J. D. Davis, Munday, Texas.—p. 707.

100 Malaria Survey of Impounded Water. H. R. Carter, Baltimore.—p. 708.
101 Report on Typhoid in Birmingham with Recommendations for Its Eradication. L. L. Lumsden, Washington.—p. 711.
102 Penetrating Wounds of Abdomen, with Injury to Viscera; Report of Two Cases. R. C. Dorr, Batesville, Ark.—p. 715.
103 Surgical Treatment of Nephritis. R. E. Stone, New Orleans.—p. 720.
104 Surgery of Colon. F. Y. Cronk, Guthrie, Okla.—p. 722.
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107 Education of Railway Employee in First Aid Work. A. C. Scott, Temple, Texas.—p. 727.
108 Leukosarcoma of Choroid; Report of Case. H. Moulton, Fort Smith, Ark.—p. 738.
109 Suspension Laryngoscopy. R. C. Lynch, New Orleans.—p. 741.
110 Harelip and Cleft Palate. T. E. Carmody, Denver.—p. 744.
111 Medical Trust. I. W. Cooper, Newton, Miss.—p. 749.

91. **Study of Spartein Sulphate.**—From Zeigler's observations it appears that spartein is not toxic to the frog. The heart is slowed and weakened by a depressant action on the heart muscle and by a stimulation of the vagus endings. Spartein slows the turtle's heart by stimulation of the vagus endings and by a depression of the heart muscles. Spartein slows the heart of the rabbit. It slows the respiration, decreases the flow of urine, and causes a fall in blood pressure. Spartein causes a preliminary rise of blood pressure in the dog, followed by a fall. The fall was not so marked when small doses were given. The kidney oncometer shows a decrease in volume in a majority of the experiments. There is a slight increase in urine flow with the rise and the first fall. The experiments did not prove conclusively the cause of the rise in blood pressure, but the results obtained with the kidney oncometer tend to show that it is due to a vasoconstrictor action. The fall is due to stimulation of the vagus. This is proved by first injection of atropin and afterward by spartein. Atropin seems to increase the toxicity of spartein.

92. **Clinical Study of Various Digitalis Drugs.**—The discussion of the relative value of the various drugs making up this group is started by Halsey by the statement that, from the standpoint of the clinician, they differ from each other mainly in the rate and certainty with which they are absorbed and excreted and in their local action before absorption. Clinically there appear to be no qualitative differences of practical significance in their all important actions on the circulation. And all who have sufficiently investigated their clinical effects have reached the conclusion that once it has been absorbed in sufficient amounts, digitalis produces all the desirable effects which may be produced by any of the others. Further, it has been established that, contrary to very generally held views, digitalis is absorbed more rapidly and certainly and is less irritant to the stomach than any of its congeners. Many of the older textbooks (and some of the newer ones) state that, as strophanthus is absorbed more rapidly and is less irritant to the stomach, it is to be preferred to digitalis where prompt action is desirable or where the digestion is disturbed. The real facts, Halsey says, are directly opposed to this. There is but one way to give strophanthus and that is intravenously, using, if it be obtainable, either the crystalline strophanthin or ouabain in dosage not to exceed one half of a milligram (1/100 of a grain), reserving such use of it for cases urgently needing a "digitalis" effect, and never giving it, except in still smaller amounts, to patients who have been taking digitalis or any of this group in the recent past. This dose may be repeated, if needed, in eighteen to twenty-four hours. Its effects are usually apparent in fifteen to thirty minutes and persist for twenty-four hours. Used in properly chosen cases and in proper doses, the prompt and useful effects of this drug are among the most gratifying. In regard to the clinical value of apocynum and squill Halsey states positively that he has never seen either of these drugs do good in any case in which digitalis had failed after a fair trial. They have no advantages under any clinical conditions over a good preparation of digitalis.

As to digitalis Halsey prefers the tincture. For various widely advertised proprietary digitalis preparations Halsey claims that a number of extravagant and false or misleading claims are made. Among the commonest of these is the claim that the preparation in question is free from cumulative action. Any preparation of digitalis free from cumulative action is also without therapeutic value. In digipuratum the digitalis active principles are present in a form in which they are insoluble in the stomach. Consequently they do not irritate the gastric mucosa, although after absorption they, like all digitalis bodies, stimulate the emetic center and consequently can and do cause vomiting. Digipuratum is, however, a preparation of very uniform strength, and were it not for its high cost Halsey says he would never use any other for oral administration. Digitalin, as commonly used, is the so-called digitalin germanicum, which is a mixture of varied composition and of uncertain strength. Different samples vary in strength so that some are more than twice as powerful as others. One sixtieth of a grain of this preparation is equal in therapeutic activity to from 3 to 5 minims of an average tincture of digitalis.

99. Abstracted in THE JOURNAL, Dec. 11, 1915, p. 2118.

Surgery, Gynecology and Obstetrics, Chicago

August, XXIII, No. 2

112 Bone and Joint Disease in Relation to Typhoid. J. B. Murphy, Chicago.—p. 119.
113 *Primary Treatment of Wounds in Civil Practice. M. F. Porter, Fort Wayne, Ind.—p. 144.
114 Separation of Lower Femoral Epiphysis; Report of Two Cases. W. R. MacAusland, Boston.—p. 147.
115 Indications For and Results of Cerebral and Cerebellar Decompression in Acute and Chronic Brain Disease. C. A. Elsberg, New York.—p. 153.
116 *Transplantation of Free Flaps of Fat. A. B. Kanavel, Chicago.—p. 163.
117 Peripenic Muscle; Some Observations on Anatomy of Phimosis. G. Jefferson, Victoria, B. C.—p. 177.
118 Gas Bacillus Infection; Surgical Bacteriology. J. C. Bloodgood, Baltimore.—p. 182.
119 Beginnings of Birth Control Movement. J. A. Field, Chicago.—p. 185.
120 Some Practical Aspects of Birth Control. R. S. Yarros, Chicago.—p. 188.
121 Therapeutic Value of Radium in Pelvic Cancers. H. Schmitz, Chicago.—p. 191.
122 Simple Sterilization of Women by Cautery Stricture at Intra-Uterine Tubal Openings, Compared with Other Methods. R. L. Dickinson, Brooklyn.—p. 203.
123 *Genital Elephantiasis Following Extirpation of Inguinal Glands. J. T. Windell, Louisville.—p. 214.
124 *Pseudomyxomatous Cysts of Appendix and Ruptured Pseudomucinous Ovarian Cyst. F. W. Bailey, St. Louis.—p. 219.
125 Diathermy in Malignant Tumors of Bladder. L. E. Schmidt and G. Kolischer, Chicago.—p. 223.
126 *Simple Technic for Resection of Prolapsed Rectum. G. W. Brock, Atlanta.—p. 225.
127 Uncomplicated and Convenient Intestinal Anastomosis Clamp. J. R. Eastman, Indianapolis.—p. 225.
128 Use of Fat Transplantation in Kidney and Bladder Surgery. G. Kolischer, Chicago.—p. 227.
129 Simple Mechanotherapeutic Apparatus for Military Hospitals. J. M. Flint, New Haven, Conn.

113. **Treatment of Wounds in Civil Practice.**—Porter says that in his work in cleansing wounds and the areas immediately surrounding them, gauze has largely replaced the brush and curet; time, patience and care have supplanted vigor; and strength in antiseptic solutions has been abandoned in favor of quantity. Even where there is strong reason for believing that foreign bodies are imbedded and are likely to cause trouble, he says, it will be better to allow them to remain at the primary dressing and await until Nature has had a chance to complete her defenses before attempting their removal. To postpone amputation until the symptoms of shock have subsided is regarded as a grave mistake. A hypodermic injection of morphin and atropin is given, artificial heat applied, a transfusion is done, hypodermoclysis or rectal injection is given if necessary while the patient is being anesthetized, or if the need for this stimulation is not urgent the amputation is quickly done and a sufficient amount of normal salt solution is injected into the open mouth of a vein in the stump after removal of the tourniquet, and the wound is closed and dressed. Extreme caution is urged about removing bits of tissue which seem hurt beyond recovery. The objection to this "trimming" process is that it opens new atria for infection, causes unnecessary sacrifice of

tissue, increases the bleeding, and adds to the time anesthesia. As a rule dry dressings are preferred. Raw surfaces should be covered by narrow strips of protective to prevent sticking of the dressing and the consequent disturbance of the granulations when the dressing is changed. A nonodorous, nonirritating antiseptic powder used freely in lacerated wounds is advantageous. Porter believes that prophylactic measures against tetanus are uncalled for and would better be withheld in the treatment of all accidental wounds save those received under circumstances rendering infection by the tetanus bacillus probable.

116. **Transplantation of Fat.**—Out of thirty-two cases reported by Kanavel secondary infection with loss of the fat occurred in four breast cases, and here the result was probably due to the nature of the operation and the large field and the osteomyelitis cases. Therefore, the author thinks it would seem safe to say that fat can be transplanted into any ordinary field with the assurance that it will not act as a foreign body. Clinically, it would appear to live and become a part of the structure in which it is placed. His results would seem to indicate that the greatest value of fat transplantation is to be found in its use in plastic operations to restore mobility and remove disfigurement, as a protection to prevent contracture about vessels and nerves, and to prevent adhesions about tendons and joints. Its use in tuberculous joints and bones is still a fruitful field of study, and the same may be said of its use in traumatic epilepsy, although it can be used safely to obliterate defects in brain tissue. In the author's hands the use of fat transplants in large, open potentially infective areas, such as are present after breast amputations, etc., and in osteomyelitis, has not been satisfactory.

123 and 124. Abstracted in THE JOURNAL, January 15, pp. 216 and 217.

126. **Resection of Prolapsed Rectum.**—The modification recommended by Brock consists in performing the Mikulicz operation over a proctoscope or a round billet of wood, introduced through the lumen of the prolapsed mass.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

July 22, II, No. 2899

1 Industrial Diseases. J. W. Edwards.—p. 97.
2 Head Injuries in War. A. W. Addinsell.—p. 99.
3 Treatment of Hernia Cerebri. S. Smith.—p. 102.
4 Treatment of Fractured Mandible Accompanying Gunshot Wounds. H. P. Pickerill.—p. 105.
5 Treatment of Chlorin Gas Poisoning by Venesection. A. S. Hebblethwaite.—p. 107.
6 Death After Nitrous Oxid-Oxygen and Local Anesthesia. W. J. McCardie.—p. 109.

Journal of Tropical Medicine and Hygiene, London

July 15, XIX, No. 14

7 Paracholera Caused by Vibrio Gindha Pfeiffer 1896. A. J. Chalmers and N. E. Waterfield.—p. 165.

Lancet, London

July 22, II, No. 4847

8 *Cardiac Disabilities of Soldiers on Active Service. J. Parkinson.—p. 133.
9 Enteric-Like Fever in Anglo-Egyptian Sudan. A. J. Chalmers and N. MacDonald.—p. 139.
10 Gangrene of War; Gaseous Cellulitis or Emphysematous Gangrene. A. J. Hull.—p. 144.
11 *Cardiac Symptoms Following Dysentery Among Soldiers. E. B. Gunson.—p. 146.
12 *Radical (Excision) Treatment of Gastric Ulcer. J. Cunning.—p. 147.
13 Treatment of Hemorrhoids by Interstitial Injection. T. Bird.—p. 149.
14 Unusual Case of Albuminuria. O. Leyton.—p. 150.

8. **Cardiac Disabilities of Soldiers.**—Parkinson records the result of an inquiry into the various conditions which lead men on active service to report sick with symptoms suggesting heart disease. It is based on ninety cases. There were twenty-two among the ninety cases in whom other diseases were demonstrable. Valvular disease was present in twenty-eight. Forty men complained of cardiac symptoms, especially breathlessness and precordial pain, but in whom no physical sign of heart disease could be found. Parkinson says that this is not a specific variety of heart disease and needs no such name as "soldier's heart." In about half the cases in this series the disability had been present to some extent in civil life and was therefore not the result of military service. The relative cardiac inefficiency may be: (*a*) a sequel of acute rheumatism, dysentery, influenza or other infection; (*b*) the result of myocardial changes due to age, especially in soldiers over 40; (*c*) associated with functional nervous disorder, particularly in cases in which the palpitation is a prominent complaint; (*d*) due to endowment with a heart of limited efficiency, so that the individual has always been short winded and fails to improve under training. The cause may be a congenital incapacity for full development of the heart, an unrecognized infection during infancy, or the absence of physical training during adolescence. A simple exertion test, such as climbing twenty-five to fifty steps, reproduces the symptoms in these patients and so furnishes valuable information on the functional efficiency of the heart. Some degree of myocardial disease is present in a number of cases.

11. **Cardiac Symptoms Following Dysentery.**—In a series of sixty-five cases of dysentery recorded by Gunson three fatal cases all presented signs of considerable circulatory embarrassment. The pulse became extremely feeble and at times was imperceptible at the wrist. The extremities were cold and clammy. In the terminal stages cardiac dilatation occurred and was associated with extreme cyanosis, particularly of the face, head and neck. Temporary relief of symptoms was afforded by epinephrin. Of the patients who recovered 17 per cent. presented symptoms of circulatory inefficiency, persisting into the third week of convalescence, when the patients were transferred to England. Dyspnea, palpitation, precordial pain, vertigo and a sense of exhaustion were the chief complaints. The exhaustion met with in the severe cases was greater than the muscular atrophy and weakness seemed to justify, though there was no evidence pointing to organic disease of the central nervous system. The high incidence of persistent cardiac symptoms is attributed mainly to the fact that the majority of the patients continued on duty in the trenches until completely exhausted; another factor was the exertion of walking to the lavatory, necessary even during the early stages of the disease, owing to the exigencies of active service. Cardiac symptoms during convalescence from dysentery, Gunson says, are of importance in relation to soldier's heart, as dysentery unquestionably contributes a certain number of cases to this group. Therefore, after a severe attack of dysentery adequate rest in bed should be assured to obviate consequent cardiac derangement.

12. **Radical Treatment of Gastric Ulcer.**—Cunning claims that all gastric ulcers can be excised except those which are adherent to important structures in the neighborhood, and that gastrojejunostomy is useless for these. When the ulcer is adherent to important structures the stomach can be detached from the base of the ulcer, the opening closed, and the base of the ulcer, after being scraped and being now excluded from the stomach, will give no further trouble.

Medical Journal of Australia, Sydney

June 24, I, No. 26

15 Field Ambulance with Fourth Infantry Brigade in Gallipoli. J. L. Beeston.—p. 497.
16 Case of Epithelioma of Lip. C. E. Corlette.—p. 499.

July 1, II, No. 1

17 Metric System in Prescribing. J. C. Verco.—p. 1.
18 Second Case of Intra-Orbital Growth Removed by Krönlein's Operation (Osteoplastic Resection of Outer Wall of Orbit). F. A. Pockley.—p. 5.

July 8, No. 2

19 Criminology as Branch of Medicine. W. A. T. Lind.—p. 19.
20 Calcified Glands Mistaken for Ureteral Calculus. D. Kelly.—p. 23.
21 Jackson's Parietocolic Membrane Producing Symptoms. C. E. Corlette.—p. 23.

Sei-I-Kwai Medical Journal, Tokyo

July, XXV, No. 7

22 Investigation of Diabetes Mellitus Among Japanese. (To be continued.) S. Iwai.—p. 35.

Archives Mens. d'Obstétrique et de Gynécologie, Paris

June, V, No. 4, 5 and 6, pp. 93-188

23 Research on the Normal Human Placenta at Different Stages of the Pregnancy. (La villosité du placenta, ses formations mitochondriales et ses processus d'élaboration.) M. de Kervily.—p. 93. To be continued.

24 *Uterus and Tubes Found in Inguinal Hernia in Man. A. Brindeau. —p. 150.

25 *Tuberculosis of Uterine Cervix, Probably Primary. M. Metzger. —p. 157.

26 The Midwife System at Buenos Aires. (La sage-femme à Buenos-Ayres.) P. Pellissier.—p. 160.

24. **Uterus in Inguinal Hernia in Man.**—Brindeau's patient was a virile man of 35, apparently normal except for inguinal hernia. The sac contained a uterus of normal adult size, with both tubes, and on drawing them out both testicles came with them. One testicle seemed normal but the other was very small. The danger of injuring the testicles was too great to risk removing the uterus, so the small testicle was resected and the uterus was utilized to block the large inguinal canal, suturing it to the ring. Brindeau found eighteen similar cases recorded in Neugebauer's book on hermaphrodism, and gives a brief summary of each. A few of the men had families. In 25 per cent. of the cases the uterus was double. The testicles were rarely normal. In a few cases the uterus was continuous with a vagina which opened into the urethra. It is generally better to remove the uterus at the herniotomy. His compilation includes Webster's two cases.

25. **Tuberculosis of Uterine Cervix.**—Metzger's patient was a woman of 33 who for four years had had occasional vaginal hemorrhages outside of the menses, which were regular, and there was occasionally a greenish yellow discharge. She had taken treatment but no one knew what was the trouble, and there was no improvement. When Metzger saw her she had no pain, but tired easily and had grown very thin. The uterine cervix showed two small irregular ulcerations, with slightly raised edges, surrounded by sound mucosa. They bled at the slightest touch. There was no discharge from the uterus. The diagnosis of cancer was rendered improbable by the limited area covered by the ulcerations, although the affection was of several years' standing, and by the absence of fetid odor. Microscopic examination of an excised scrap confirmed the probable tuberculous nature of the lesion although no tubercle bacilli were found. As the woman seemed free from tuberculosis otherwise, her husband was examined and an old apical tuberculous process was evident. He had a history of hemoptysis and expectoration but had no cough at the time. The testicles showed no signs of tuberculosis but there had been a urethral discharge about four years ago for a time which finally subsided without treatment. This may have been a genital manifestation of his tuberculous infection and have been the source of his wife's genital lesion. She has apparently entirely recovered since the amputation of the cervix last March, and has been gaining regularly over 2 pounds a month.

Bulletin de l'Académie de Médecine, Paris

July 11, LXXVI, No. 28, pp. 17-34

27 *Dangers of Radiotherapy. Gaucher.—p. 17.

28 *Systematic Measures for Detection of Tuberculosis in Soldiers. (Note sur les mesures prises dans le camp retranché de Paris pour le depistage, l'isolement et l'élimination de l'armée des tuberculeux militaires.) Sieur and L. Bernard.—p. 21.

29 *Disinfectant for War Wounds, Germicidal and Leukocyte-Attracting. P. Duret.—p. 23.

30 Apparatus for Mobilizing Stiff Joints. Leullier and others.—p. 25.

31 Resemblance between Course of Typhoid under Serotherapy and After Vaccination. G. Etienne.—p. 30.

27. **Dangers of Radiotherapy.**—Gaucher has been much disappointed with the effects of Roentgen and radium treatment of skin affections and especially of superficial cancer. They do not ward off recurrence and Roentgen ulceration may develop even as long as ten years after the exposures. In a recent case of the kind a young man has had a Roentgen ulcer develop on the back of the hand and wrist—the area that had been exposed to the Roentgen rays on account of nevus ten years before. Gaucher has seen radiotherapy cure lupus completely, while he has often seen it induce an epitheliomatous transformation of the lupus. Radium is perhaps less dangerous than the Roentgen rays, but he knows of several cases of ulceration following radium exposures and leaving deforming scars after the ulceration had healed. In a quite recent case a man of 60 with syphilitic sclerous glossitis and gummas of the tongue had been given radium treatment. The gummas on the dorsum of the tongue ulcerated and soon became transformed into inoperable epitheliomas. He declares that the Roentgen rays and radium in the treatment of skin affections, and especially of cutaneous cancer, have not given the anticipated results. They should be used with prudence and only in cases in which other modes of treatment are not applicable or have not given results.

28. **Care of Tuberculous Soldiers.**—Sieur and Bernard have organized in the Paris district a series of consulting offices for those suspected of tuberculosis, with services for exact diagnosis and a series of hospital sanatoriums. The four consulting offices are open in turn and all suspects are sent there. The differentiating service is connected with them and has 616 beds at its disposal. One of the services is reserved for officers and one for the wounded who are suspected of being tuberculous. The men are then classified as free from tuberculosis or having it in a masked form (asthma, emphysema, bronchitis), and this group is dismissed. The men with slight manifestations of tuberculosis are sent to the hospital-sanatoriums for a course of treatment, hoping that they can be cured and resume their place in the army. The third group comprises those more seriously affected. They are sent to the country sanatoriums and get their discharge from the army. The fourth group comprises the men with acute or the terminal stages of tuberculosis. These are kept in the special services to save them injury from being moved. The four hospital-sanatoriums have a total of 990 beds and after a few months' course of treatment the men are returned to the army if improved, and if not are sent to the regular sanatoriums. No "convalescence furloughs" are permitted and no one is discharged definitely from the army until he has taken a course of treatment at the hospital-sanatorium and then at a regular sanatorium. By these measures those really tuberculous are sifted out at once from the suspects; they are isolated at once and get proper treatment, while, as the regulations are uniform, there can be no complaints of discrimination or favoritism.

29. **Germicidal and Cytophylactic Disinfectant.**—Duret thinks that the two-salts solution he uses combines all the advantages of Dakin's disinfectant while free from the irritating action of boric acid on the tissues. It is isotonic with the blood serum and acts by the formation of hypochlorite of magnesium, which gradually yields up its chlorin to the tissues. He triturates in a mortar 28 gm. chlorinated lime with 18.2 gm. magnesium sulphate and then mixes with them 1,000 gm. water, and filters through cotton moderately packed in a funnel. The insoluble compounds are held back by the filter. One liter of the solution can produce 3.17 gm. available chlorin. It keeps well; even after twenty days in uncorked flasks there were still 2 gm. chlorin to the liter. After thorough mechanical cleansing of the wound he flushes it profusely with this solution at a temperature of 35 C. Its cleansing and disinfecting action is hastened by combining it with hydrogen dioxid. His tests have shown that 85 c.c. of hydrogen dioxid of twelve volumes is enough to decompose the whole of the hypochlorite in the solution. The two fluids are in separate receptacles but are mixed as they enter the wound either from separate catheters or brought to it through a single catheter. The hydrogen dioxid is diluted (100 gm. to 900 gm. water). The bubbling clears out the wound and the disinfectant is thus aided to find its way into every crevice, an aseptic solution of magnesium chlorid being left behind in the wound. The wound cavity is then rinsed out with the magnesium hypochlorite solution alone.

Journal de Médecine de Bordeaux

July, LXXXVII, No. 9, pp. 167-186

32 *Differential Diagnosis of Typhus. (Notes sur quelques cas de typhus exanthématique. Difficulté du premier diagnostic dans une épidémie.) Arnould.—p. 167.
33 *Primary Chancre on the Conjunctiva; Three Cases. (Chancre induré de la conjonctive bulbaire chez un enfant de dix ans.) H. Fromaget.—p. 170.
34 The Radish from the Therapeutic Standpoint. (Les radis en hygiène et en médecine.) P. Carles.—p. 173.
35 Aviators' Osteoma at the Back of the Neck (from Fall). Vorbe and L. Rocher.—p. 174.
36 *Needle with Handle for Aseptic Puncture. (Aiguille pour ponctions aseptiques.) Brandeis.—p. 174.

32. **Early Differential Diagnosis of Typhus.**—Arnould comments on the difficulty of detecting the first cases of typhus. When it becomes epidemic, the retrospective diagnosis is of little use. In the cases he has encountered there was always a period of slight fever with lassitude and depression and then the temperature ran up suddenly high. It may drop again the next day or two, but then flies up again and keeps high. During the prodromal stage there was always general and painful lassitude, sometimes accompanied by pain in the lumbar region or spine. Sensory disturbances were common, tinnitus, congestion of the conjunctiva, and insomnia. Cold baths, even repeated, had no effectual influence on the temperature. This was constant and may aid in differentiation. In none of the cases were any petechiae found during the early stages of the disease, and the exanthem often resembled the rose spots of typhoid. It was never typical enough to differentiate the disease alone. The diagnosis was placed on a stable basis only by exclusion of typhoid at necropsy in the first fatal case. The eleven patients were all orderlies on a hospital ship, and each had been vaccinated against typhoid.

33. **Primary Chancre on the Eyeball.**—Fromaget emphasizes that the hard chancre on the bulbar conjunctiva of the boy of 10 and in his two other cases resembled in every respect the ordinary primary lesion of syphilis. The mere aspect reveals its nature and laboratory tests confirm it, but a pseudomembranous coating may cause doubt in some cases. The slow, gradual, painless development of the chancre excludes diphtheria. In his cases the chancre cleared up promptly under salvarsan without leaving a trace or involving the iris or other parts of the eye, but the insidious impregnation of the organism continued its course, as was evident from the swelling of glands at the back of the neck and in both axillae.

Puncture needle with handle.

36. **Improved Puncture Needle.**—Brandeis' needle is made with a square side piece at the center. This serves as a handle. He seizes it with forceps parallel to the needle and works the lower end of the needle into the pipet, between its cotton plug and wall, after the needle has been passed through a flame and the cotton and top of the pipet singed. The forceps, the needle and pipet then form a solid whole as they are seized in one hand, leaving the other hand free.

Le Nourrisson, Paris

IV, No. 3, pp. 129-192

37 Sterilization of Milk by Heat. (Sterilisation du lait par la chaleur.) A. B. Marfan.—p. 129.
38 *The Symptoms of Tuberculosis in Infants. II. (Les formes envahissantes de la tuberculose du nourrisson.) Combe.—p. 155.

38. **Tuberculosis in the Nursling.**—In this instalment of his study of the symptoms of tuberculosis in infants, Combe describes typical cases of lymph-borne generalized tuberculosis and the localized forms and also those of blood-borne and bronchial origin. They include acute, subacute and chronic cheesy pneumonia and also the blood-borne types of miliary tuberculosis, acute and chronic, localized or diffuse and surgical tuberculosis of various types. The clinical picture of each in infants is described with a few roentgenograms. The tuberculosis may develop so insidiously that when the symptoms of miliary tuberculosis or cheesy pneumonia develop they seem to appear like lightning from a clear sky. But necropsy always discloses the preexisting glandular lesions. In older children the tuberculosis generally requires some intercurrent infectious disease, measles, whooping cough or some physical or emotional stress to break down the gland barrier and permit the general invasion by the tuberculosis. In older children, likewise, the invasion is not so general, as the defensive forces are better organized and the bacilli find a lodgment only at scattered points. He reiterates that in infants the generalized invasion is the rule, and it may occur by way of the lymph, the blood or the bronchi.

Paris Médical

July 22, VI, No. 30, pp. 69-84

39 Organization of System of Graduated Work in Sanatorium for the Tuberculous. (Organisation et mise en œuvre d'une cure de travail dans un sanatorium populaire.) F. Dumarest and A. Vigné.—p. 69.
40 *Red Light and Roentgenoscopy in Extraction of Projectiles from the Tissues. (Extraction rapide des projectiles de guerre par le chirurgien seul à l'aide de la lumière rouge et des repérages successifs sur l'écran radioscopique.) H. Petit.—p. 76. (Modification à la technique du Dr. H. Petit pour l'extraction des projectiles.) A. Mouchet and R. Toupet.—p. 80.
41 Suggestion for the Medical Students Serving with the Army to Complete Course by Correspondence. (Les étudiants en médecine mobilisés. Leur affectation et leur emploi dans l'armée. Leur scolarité.) Granjux.

40. **Red Light as Aid in Operating Under Roentgenoscopy.**—Petit says that by using red light and plenty of it the surgeon can have the Roentgen rays switched on and off repeatedly without a moment's loss from dazzling or fatigue of the eyes. He can thus operate under direct visual control at every step of the procedure, and with a confidence and precision unattainable under other conditions to date. He has applied this method in 148 cases and with constant success after the first tentative cases. In order to avoid danger of dermatitis, he does not use the fluorescent screen constantly, but has it switched on and off, consulting it as a steersman consults his compass. The total exposure is thus only a few minutes in all. The light bulbs can be covered with red paper.

Presse Médicale, Paris

July 20, XXIV, No. 40, pp. 313-320

42 Artificial Arms and Hands. (Prothèse du membre supérieur. Amputation de l'avant-bras.) Ducroquet.—p. 313.
43 *Interpretation of Oscillometer Findings in Studying the Lesser Circulation. (Essai d'interprétation des graphiques oscillatoires avec l'appareil Pachon.) G. Colleville.—p. 316.

43. **The Oscillometer in Estimation of the Reserve Force of Heart and Lungs.**—Colleville presents the findings with Pachon's oscillometer in a number of typical cases of various affections, striving to estimate the outlook for recovery from the biologic responses to certain tests. He applied the oscillometer according to Martinet's directions (summarized in THE JOURNAL, March 4, 1916, p. 776). They are based on the assumption that the heart and vessels form a single mechanical system so that any reaction at any point in the system is felt at various other points. The changes induced by graduated exercises and the recuperation therefrom reveal the ability of the cardiovascular apparatus to maintain the normal balance between the parts. Colleville's findings confirm anew the assumption that the nervous system—which regulates the tone of the cardiovascular system—is the most important element in the prognosis of those apparently convalescing from tuberculosis. When the nervous system is weak and depressed, the normal reaction to and recuperation from exercise do not occur. Under some stimulus to the nervous system, the oscillometer findings may increase to the normal type or even above it. The practical conclusion from his research is thus the necessity for treatment of the neurasthenia—the result of the toxic action of the disease—

before pronouncing the definite prognosis of tuberculosis. After a course of strychnin or other measures to tone up the nervous system, the oscillometer findings may throw an entirely different light on the outlook.

The respiratory capacity depends not only on the elasticity of the lung but also on the intrapulmonary circulatory dynamic force. The oscillometer permits these two factors to be estimated separately, so that breathing exercises can be undertaken to augment the elasticity of a still elastic lung or the heart can be forced to do more work by giving heart tonics. A sound person rapidly recuperates after exercise, and this occurs also even when the elasticity of the lung or the peripheral circulation is somewhat impaired, provided that the myocardium and the nervous system have sufficient reserve force.

Correspondenz-Blatt für Schweizer Aerzte, Basel

July 15, XLVI, No. 29, pp. 897-928

44 *The Medical Aspect of Workmen's Compensation and the Lessons from the War. (Unfallmedizinische Lehren aus Kriegslazaretten und Invalidenschulen.) C. Schlatter.—p. 897.
45 Differential Diagnosis between Displacement of the Intestine and Gynecologic Affections. A. Goenner.—p. 910.
46 Further Indications for Fat-Poor Special Milk. (Weitere Indikationen der Verabreichung fettarmer Spezialmilch.) F. Brandenberg.—p. 914.

44. Accident Medicine and the Lessons from the War.—Schlatter comments on the gigantic progress that has been made within the last year in the aftertreatment of the wounded, to ward off crippling. At the same time, he adds, there is a fundamental difference in the spirit with which wounded soldiers take their training. They are fired with zeal to overcome their deformity and return to fight for their country or to take up some self-supporting occupation. After an industrial or railroad accident, on the other hand, the victim is liable to profit financially by exaggerating and perpetuating his disability, instead of striving to overcome it. Schlatter describes the minute classification of the disabilities in the big Vienna training school for the wounded. It has accommodations for nearly 4,000. The difficulty of obtaining skilled teachers to train the wounded is reduced to the minimum by referring all with stiff shoulders to one ward, the stiff knees to another ward, the stiff elbows to another and so on. More than thirty trades are taught there, besides typewriting, stenography and other business courses. There are special schools for those who have lost an arm, and especially skillful one-armed men have been imported for teachers.

The great lesson from it all for accident medicine is that deforming contracture should not be allowed to develop after the injury. Immobilization kept up too long or in an incorrect position is now realized as having been the source of much avoidable deformity in the past. The experiences of the war have shown that muscular contracture is best avoided for the hand by immobilizing it in slight dorsal flexion; for the shoulder with abduction of the upper arm for 30 or 40 degrees; for the elbow, by flexion at a right angle or slightly obtuse angle with the hand in slight supination; for the fingers, in slight flexion, as this allows objects to be held between the thumb and the ankylosed fingers, while there is no grip if the fingers are straight in their stiffness. Schlatter remarks that many an indemnity has had to be paid for disability after fracture of a finger or destruction from a felon which might have been avoided if the finger had been curved enough to seize objects. He warns further to be on the alert not to allow talipes equinus to develop after an injury of the leg, from the weight of the bed-clothes or other cause. After injury of a nerve, prophylactic fixation is indispensable as otherwise the paralyzed muscles will stretch and the antagonists contract, with crippling contracture as the result.

It has been learned that immobilization for the purpose of relieving pain after crushing injuries can be dispensed with if compression is applied at once to prevent extravasation of blood. With a severe sprain of the foot the shoe is left on, to exert compression, and massage is begun the second and third day, applying it centrally from the joint, aiming to induce aspiration and open the passage to the thrombosed vessels. Puncture to relieve blood and serous effusions in a joint may relieve, but should be followed at once with compression. It has been found that not only after fracture but after severe distorsion of the ankle firm boots with flatfoot insoles should be worn.

The amputation stump is healed early with massage, baths, hot air, etc., and exercised early and often. Hirsch's advice to toughen the stump is giving fine results. The physician or the man himself pounds on the stump with his fist or a wooden hammer one or two hundred times a day. Some article is placed in the bed that he can push his stump against, and an upholstered stool is given him to practice his stump on, using it like an artificial leg. By these means the stump is soon made ready for a correct prothesis. No crutches are given the amputated, but a walking plaster cast may be applied at first. This is easy to make, with two iron strips and a foot plate. If it works loose, a new one is made. When the stump has finished retracting, a leather contrivance takes the place of the plaster. The stump is ready for the permanent artificial leg in from six months to a year. The fact that the loss of a hand or arm need not entail disability is another great lesson from this war, especially as the employers of labor are realizing this.

Gazzetta degli Ospedali e delle Cliniche, Milan

July 16, XXXVII, No. 57, pp. 881-896

47 *Clinical Diagnosis of Epidemic Cerebrospinal Meningitis. F. Pancrazio.—p. 883.

47. Clinical Diagnosis of Epidemic Cerebrospinal Meningitis.—Pancrazio expatiates on the difficulty of differentiating meningitis in some cases, especially in the aged, in the pregnant and in infants. Lumbar puncture should be repeated if the first test shows the fluid apparently sterile. It may be limpid even when meningococci are found in it. He relates a number of puzzling cases in detail, showing the various types that may be encountered, contrasting each with the other diseases which seemed probable at first. He also gives illustrations showing the characteristic attitudes assumed by meningitis patients, the knees drawn up, the head drawn back, and the characteristic herpes, which may develop by the second day of the disease but usually not until the third or fourth day. He lays great stress on the inequality of the pupils, the strabismus, and the controlateral reflex of the legs (flexing one leg on the pelvis causes the spontaneous flexion of the other leg, and extension induces a similar controlateral reflex). Bending the head forward may induce flexion of the legs on the thigh and of the thighs on the pelvis. There may be also a special type of respiration in which the excursions of the diaphragm and of the thorax are not synchronous, the abdomen sinking in during the phase of inspiration at times. Photophobia is often pronounced from the first. Pressure on the internal aspect of the thigh at the line between the middle and lower thirds of the thigh, along the canal of the adductors, causes sudden pain so that the patient exclaims and withdraws his leg, while pressure on the neighboring regions causes no disturbance. This sign is said to have been found even during the prodromal stage of meningitis but Pancrazio has not found it constant in his cases; marked in some, it was absent in others. He says of Kernig's sign that while it is constant in epidemic meningitis he has found it also pronounced in certain cases of meningism complicating typhoid, etc.

The malignant form of the disease and the protracted form are particularly liable to be misinterpreted. Syphilitic meningitis seldom comes on with a sudden onset; there has usually been a period of recurring dizziness, headache, generally frontal, some impairment of vision and there is no fever, but the Kernig and some other signs may be positive. In examining an unconscious patient, the fever, the attitude, the pupil changes, the absence of a blue line on the gums, and of enlargement of the spleen, absence of signs of syphilis or cardiovascular disease and of albuminuria should all be taken into account; this clears the field for the diagnosis of meningitis. In one of the cases reported the symptoms were apparently those of typhoid and the pathognomonic symptoms

of epidemic meningitis did not develop until late in the second week when lumbar puncture disclosed the meningococcus.

Brazil-Medico, Rio de Janeiro

June 24, XXX, No. 26, pp. 201-208

48 *Preliminary Report on Method for Determining Tension of Carbon Dioxid in Alveolar Air. (Sobre os principios para um novo methodo de determinação da tensão de Co^2 no ar alveolar.) M. O. de Almeida.—p. 203.

July 1, No. 27, pp. 209-216

49 Beriberi with Flaccid Paralysis in Boy of Nearly 3. (Um caso de beriberi infantil.) M. Gesteira.—p. 209.

48. Determination of Carbon Dioxid Tension in the Alveolar Air.—Almeida gives a formula which, he thinks, will much facilitate the estimation of the carbon dioxid tension in the alveolar air. The air expired in a deep and in an ordinary expiration is collected in two gas-meters. The total quantity of carbon dioxid contained, respectively, in the two expirations are represented by Aa and Bb, A and B representing the total volume of each expiration, and a and b the percentage of carbon dioxid. As each expiration is the sum of the alveolar air and the air of the dead space, its composition is evidently equal to the air inspired by the individual, and we can state it in the two equations:

$$Aa = (A - E)\,T + E\,g$$
$$Bb = (B - E)\,T + E\,g$$

E representing the volume from the dead space, and T the alveolar tension of carbon dioxid, and g the tension of carbon dioxid in the inspired air.

The two equations thus represent a system with two unknown quantities, T and E. To determine the value of T we subtract one equation from the other, which gives:

$$T = \frac{Aa - Bb}{A - B}$$

Almeida says that this formula shows at once its advantages. It permits the analysis of the alveolar air in the simplest manner, without the necessity for complicated apparatus, as the volumes of A and B are so large the analysis can be made with ordinary apparatus such as are found in the usual laboratory, without any special measures for analysis of minute quantities. The method is particularly useful for experimentation on animals. He discusses in conclusion a source of possible error with other technics, and shows how this possibility is practically eliminated with his formula. As experience is gained with it, the amounts expired can be reduced more and more, thus increasing the precision.

Semana Medica, Buenos Aires

XXIII, No. 21, pp. 597-624

50 *Sclerosis of Pulmonary Artery. (Cardiacos negros de A. Ayerza.) C. P. Mayer.—p. 597. To be continued.

51 Vaccine Therapy of Whooping Cough. (Consideraciones sobre 6 casos de coqueluche tratados con la vacuna coqueluche del doctor Krauss.) A. D. d'Atri.—p. 607.

52 Examination of Puncture Fluids. (Liquidos de puncion.) G. Costa. —p. 611.

No. 23, pp. 625-652

53 Intradermal Suture; Technic. G. B. Arana.—p. 625.

54 Final Outcome of Prostatectomies. G. Borra.—p. 645.

55 Arsenotungstic Reaction with Phenyl-Dimethyl-Dimethylamino-Pyrazolon. (Una nueva y sensible reaccion de la piramidon.) L. Guglialmelli.—p. 646.

56 Sodium Iodid. A. A. da Matta.—p. 647.

50. Sclerosis of Pulmonary Artery.—The main points of Mayer's article were summarized in an abstract of the first instalment (abstract 72, June 10, 1916, p. 1896).

Siglo Medico, Madrid

July 8, LXIII, No. 3265, pp. 433-448

57 *The Determination of Pepsin in the Urine. (La pepsina de la orina y su importancia para el diagnostico.) C. Fernandez-Arroyo.—p. 435.

58 *Injury of the Middle Colic Artery during Operations on the Stomach. L. Urrutia.—p. 434.

57. Pepsin in the Urine.—Arroyo has been testing the urine for pepsin by various technics and tabulates the findings in forty cases for comparison. He found the Fuld and Hirayama method the most reliable. The findings were variable in different cases of the same affections and at different times in the same case, so that the presence of pepsin in the urine is of no value in the diagnosis of disease of the digestive apparatus. The only constant finding he could discover was that little if any pepsin could be found in the urine of the pregnant women he examined.

58. Operative Injury of the Middle Colic Artery.—Urrutia accidentally severed the middle colic artery in the course of a gastrectomy for cancer of the pylorus in a man of 35. He arrested the spurting blood by ligating both stumps and no disturbance of any kind followed. This shows, he says, that the ligation of this artery does no clinical harm. When there has been trouble after ligating this artery, other factors must have been responsible for it.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

July 22, II, No. 4, pp. 277-372

59 *Agglutination in Typhoid in the Vaccinated. (De beteekenis der reactie van Gruber-Widal voor de diagnose "febris typhoidea" bij de ingeenten.) H. Aldershoff.—p. 284.

60 Community Problems and Heredity. (Iets over het verband tusschen gemeenschapsproblemen en eenige resultaten der moderne erfelijkheidsleer.) J. P. Lotsy.—p. 296.

61 Nutritional Value of Whole Wheat Bread. (Over de voedingswaarde van volslagen kropbrood.) E. C. Van Leersum and J. Munk.—p. 316.

59. Agglutination After Vaccination Against Typhoid.—The reports in this line have been conflicting in the last year, and Aldershoff has been investigating this subject in several hundred persons. He studied the agglutinating property in sixty-seven persons who had never had typhoid, in 156 who had an attack from a few months to years before, in addition to groups of the vaccinated, healthy or with disease suggesting typhoid. His conclusions from research on these seven groups are to the effect that macroscopic agglutination of living typhoid bacilli at a dilution above 1:25 is suspicious of typhoid if the individual has never had typhoid. In 69 per cent. of those who have had typhoid, the agglutinating property is lost by the end of the seventh month. In 18 per cent., however, it is retained for years, but finally very slowly dies out. With the Spronck antityphoid vaccine, the agglutinating property was lost in six months by over 90 per cent. of those vaccinated. In those who have had typhoid, if the agglutinating property is still evident, inoculation with antityphoid vaccine may increase it, but if it has been lost, then the vaccination will not restore it in a certain percentage of the cases. Inoculation with the vaccine, in those who have been vaccinated before, does not restore the agglutinating property in all the cases. In a group of persons who were having or had passed through a second attack of typhoid fever, he found that the agglutinating property was absent in a certain proportion of them. Persons vaccinated against typhoid who acquire typhoid fever may not have any agglutinating power. Positive agglutination in them is conclusive only when the titer of the agglutination rises, and it is certain that it is not a question of co-agglutination from infection with some bacillus of the typhoid family. The work issues from the central laboratory of the National Public Health Service for the Netherlands.

Hygiea, Stockholm

July, LXXVIII, No. 13, pp. 881-992

62 *Primary Gonococcus Epididymitis. (Om primär epididymit—och urethritis posterior.) G. Ahman.—p. 881.

63 *Myelogenous Leukemia with Destructive Process in Internal Ear. (Ett fall av myelogen leukämi med labyrintförstöring.) D. Rudberg.—p. 898.

64 Holding Process for Sterilization of Milk. (En ny pasteuriserings-method för mjölk och dess praktiska betydelse.) L. Wolff. —p. 905.

62. Primary Epididymitis.—Ahman thinks that the four cases he reports may throw some light on the etiology of epididymitis and posterior urethritis. In each case the men had been under repeated observation for a few years as they were being treated for old syphilis. No signs or symptoms of gonorrhea had been observed by him in any of them at any time, and they had no history of gonorrhea. One was a merchant of 29 and as soon as Ahman had informed him that he was free to marry, he wedded a widow. In two days

he was back at the office with severe gonococcus epididymitis and posterior urethritis and the bride was found to have chronic gonococcus trouble. The circumstances were much the same in the other cases—after months of abstention a night of venereal excesses. Toward the latter part of the orgy conditions must have been such as to induce aspiration into the urethra. P. Asch has called attention to the possibility of aspiration in these circumstances, and Oppenheim and Löw have further confirmed its possibility by discovery of antiperistaltic movements in the vas deferens under certain conditions. Ahman had examined the prostate and its secretion with special care a few days before in the bridegroom and found them normal. The evidence is thus all in favor of the trouble being a primary epididymitis and posterior urethritis. They soon yielded to treatment without involving the prostate.

63. **Leukemia Involving the Internal Ear.**—The man of 44 had been robust until 1915 but after a thorough chilling he began to feel languid and have headache, with subjective noises in the ears, and he gradually became deaf in the left ear. The right ear became affected in an acute form later, as the myelogenous leukemia developed in a pronounced type. Rudberg reviews the analogous cases on record, including Alexander's fifteen with necropsy in 12, a total of about twenty-four on record. The leukemia trouble in the labyrinth may be from hemorrhages or leukemic infiltration or both.

Norsk Magazin for Lægevidenskaben, Christiania

July, LXXVII, No. 7, pp. 845-988

65 *Foreign Bodies in the Esophagus, Trachea and Throat. (Om fremmedlegemer i spiserør, luftrør, og strupe.) F. Leegaard.—p. 845.

66 *Detection of Typhoid Bacilli in Search for Carriers. (Undersøkelse paa tyfusbaciller i avføring.) B. Wilmann.—p. 879.

67 Disproportionate (Eunuchoid) Growth in Length of Limbs in Women; Two Cases. (Uproportionert vekst hos kvinder.) C. Schiøtz.—p. 909.

68 *Case of Paralysis of the Vagus Nerve. (Et tilfælde av vaguslammelse.) L. Nicolaysen.—p. 948.

65. **Foreign Bodies in Esophagus and Trachea.**—In all but one of the cases reported and illustrated by Leegaard, the foreign body was extracted by the natural route under direct visual inspection or was passed in the stools later. It is easier to introduce the esophagoscope with the patient seated, but this may have been responsible for the foreign bodies slipping down into the stomach in three of the cases. "For this reason," he adds, "Jackson, the American virtuoso in this line, places the patient in the reclining position, regardless of his age." Leegaard is now convinced that this is better for children, at least, as the physician does not have to combat the attraction of gravitation as when the patient is sitting up. In one case the irritation from the foreign body had caused the tissues to swell so that they hid completely the foreign body, demonstrating anew the advantages of prompt extraction before inflammatory reactions have had time to develop. He comments further on the advantage of aspirating out of the esophagus the mucus secreted under the irritation from the foreign body. A water-jet-pump aspirating device answered the purpose in his cases. A dilatation esophagoscope was very useful in some cases. When there is danger of injuring the esophagus by drawing the foreign body up and out, he insists that it is better to let it slide down into the stomach. It can then be followed with the Roentgen rays and the abdominal surgeon can extract it with comparatively little trouble if circumstances demand. The intestines have such a wonderful capacity for carrying off foreign bodies without harm that it is seldom necessary to interfere.

In four of his fifteen cases the foreign body was part of a set of false teeth, swallowed while sleeping. A foreign body of this kind usually catches at some point almost at once as it enters the esophagus, which is one of the reasons why adults can be examined sitting. In four of the fifteen cases there was a stricture from having swallowed lye at some time. Any tendency to a stricture helps in catching and holding the foreign bodies. In two of the cases a plum stone was caught between two such strictures. In one of the cases a metal foreign body which had been swallowed entailed an infectious process in and around the esophagus. In time this caused a protrusion in the back. It was during Roentgen examination of this hump that the foreign body in the esophagus was casually discovered. He further reports a series of twelve buttons or beads removed from the trachea in different cases.

Unless the Roentgen picture is unmistakable, it may prove misleading, as in one of his cases in which a woman of 29 related that she had swallowed a piece of bone a week before, and it had stuck in her gullet. She could feel it there, and the sound also gave the impression of a foreign body. Esophagoscopy was dubious as a low protrusion in the lining prevented inspection of the whole passage. The roentgenogram showed a shadow, a handsbreadth above the diaphragm, which was assumed to be cast by the foreign body. In order to reach it a rib was resected and the esophagus opened, but nothing was found. The patient died from postoperative pneumonia, and necropsy revealed that the shadow had been cast by a bunch of calcified glands. A negative roentgenogram is decisive, if certain that the foreign body incriminated is of metal, but otherwise not, if the technic is correct. Esophagoscopy is the more reliable of the two. He used Killian's suspension laryngoscope with good results in some cases, especially in a young child who got a small bone in his larynx while eating bean soup beside his mother.

66. **Detection of Scanty Typhoid Bacilli in the Stools.**—Wilmann gives a historical sketch of this line of research, and describes his own tests to isolate the typhoid bacilli when they are present only in small numbers. As they are liable to be unevenly distributed, he mixes a large lump of the feces with physiologic salt solution in a mortar and takes one of two drops of the mixture to sow on the Drigalski-Conradi medium, spreading it on four or five plates. Comparative tests of this method have demonstrated its superior reliability, especially in seeking for carriers and in convalescents. The livelier movements of the typhoid bacilli are an aid in differentiation. He obtained almost pure cultures of these bacilli in tests with equal numbers of them and of colon bacilli, each in 2 c.c. saline. One drop of each emulsion was placed on a small groove in filter paper and placed on the bottom of a glass cylinder, about 8 cm. tall, which was then filled cautiously with bouillon, covered, and placed in the thermostat. At intervals thereafter one drop from the surface of the bouillon was transferred to the Drigalski-Conradi culture medium which was then incubated for twenty-four or forty-eight hours. Some of the plates inoculated after an interval of only two hours showed three colonies of colon bacilli and eighty of typhoid; after four hours only four of the former and 200 of the latter. The typhoid bacilli are so much more motile than the colon bacilli that they work through the layers of filter paper much quicker than the colon bacilli. This occurred the same even when a 1 cm. layer of sand, pulverized pumice stone or chalk was poured on the filter paper. Positive findings were obtained with this motility test even when all other tests were negative, especially when the suspension of the larger amount of feces was used. Complete details of twenty-one applications of the test, controls, and results are given. They show among other things that the motility of the colon bacillus is greater than is attributed to it by the textbooks. By the end of six hours the majority had worked up to the surface. Attempts to hold back the colon bacilli by adding an agglutinating serum to the fluid were not successful. Litmus-milk sugar-agar seemed to work a little better than the Drigalski-Conradi medium. He advises, in testing for carriers, to give a laxative beforehand to drive more bile into the feces, as lurking typhoid bacilli are usually ensconced in the bile apparatus.

68. **Vagus Paralysis.**—In Nicolaysen's case a married woman of 43 had a scirrhous cancer of the breast with metastases in spine and lungs. The pulse was between 120 and 140 and this was explained at necropsy by the discovery that the cardiac plexus was entirely involved in the cancerous growth, thus arresting the normal inhibiting action of the vagus on the heart. The clinical diagnosis of vagus paralysis was thus confirmed.